Scientific American

AN ILLUSTRATED

JOURNAL

OF

ART & SCIENCE

MECHANICS

VOLUME XV. NEW-YORK PUBLISHED BY MUNN & Co. NEW SERIES.

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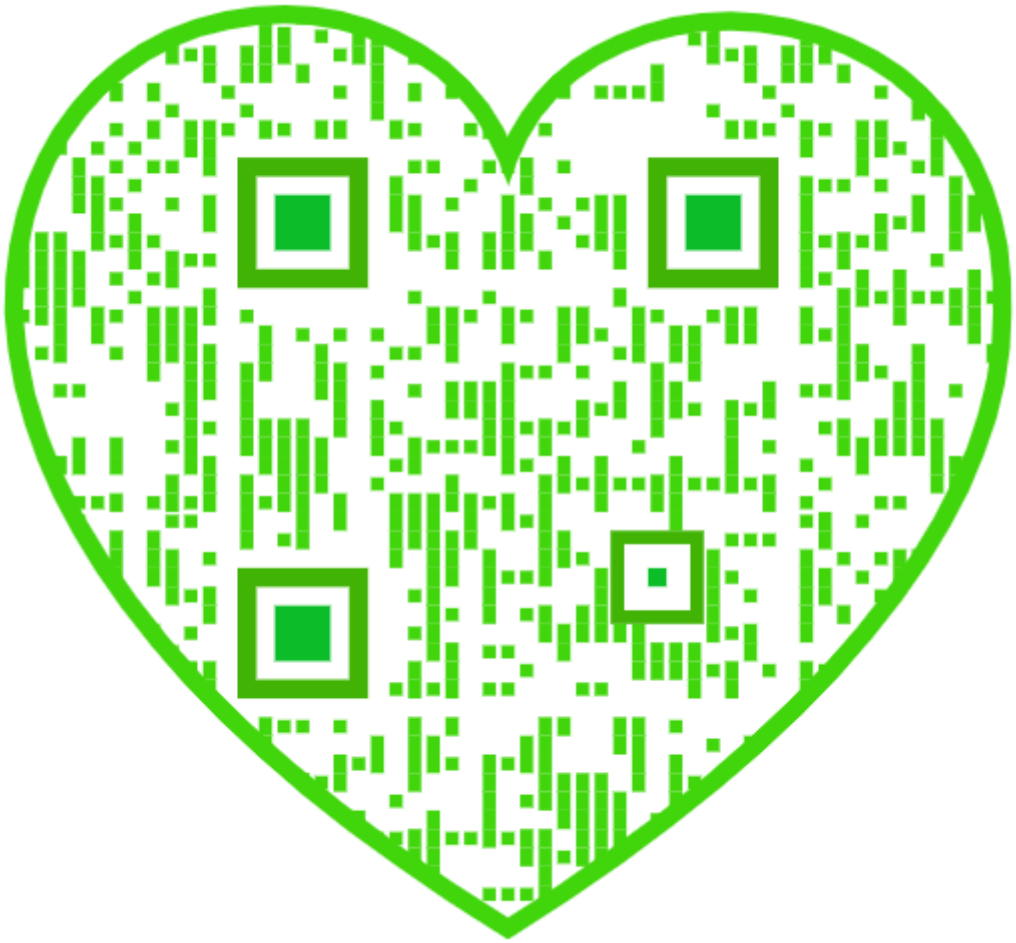

Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XV.---No. 1. [NEW SERIES.] NEW YORK, JUNE 30, 1866. $3 per Annum, [IN ADVANCE.]

Improved Balanced Governor Valve.

Any one familiar with the principles of a steam engine, the details, and their operation, must see at once that it is not in the nature of things that it should run properly at all times unless some device be applied to give it steam as it needs it. Of course, if the load is at one moment great, and at another reduced to little or nothing, the flow of steam must be regulated accordingly, to insure proper results. This the ordinary governor does not do, as we have remarked very many times before. In flour mills it is particularly necessary to have a continuous and steady velocity, and also in rolling mills, where, in one minute, when the bolt is passing through the rolls, the resistance on the engine is very much increased, and at another let off entirely.

The valve shown in this engraving is one that has been well tried and pronounced satisfactory by those who use it. It is, as may be seen, two disks, A (see Fig. 4), having ports, B, in the side for the admission of steam. These disks are quite independent of each other, but are, at the same time, connected by screw bolts, C, having right and left threads, so that they can be set up to their seats in the chamber, D; these bolts do not transmit the strain of working the valve or disks from the shaft, there being a coupling, E, formed on the bosses of the disks for the purpose indicated. The valve thus formed works between walls in the body of the chamber, D, and the steam enters from the inside and passes in through the openings down to the engine through the nozzle, F—a passage being cored out for it in the body of the exterior chamber, as shown in Fig. 2. It is thus perfectly balanced, there being as much pressure from within as without, so that it may be said to float in an atmosphere of steam.

The method of operating this valve is ingenious. The ordinary form of governor ball and arm is used, but the arrangement of it is altered. The balls and arms are attached to a frame, G, which revolves by the action of the miter gearing below. The working ends of the arms, or those which operate the valve, are fitted to a coupling, H, at the top, so that they work easily up and down therein. This coupling is made in halves, which are screwed together like a box cover, and the bottom one, I, is chambered out so as to receive the button head of the rod, J, which works the valve through the intervention of the levers, K—a short one being fitted to the shaft, L, and a long one on the end of the same shaft, so that a slight movement of the rod, J, will be multiplied on the valve as the lengths of the levers are to each other.

These are the main details, if we except a method of driving the gearing by a disk, M, on the shaft, the particulars of which the inventor has not furnished us. It is claimed, justly, that this valve will operate well if properly cared for, and that it is sensitive and durable to a high degree. It can be adjusted to close entirely, or in part, and is, in all respects, a useful invention. This invention was patented July 30, 1861. For further information address the White's Governor Valve Co., Galesburg, Ill.

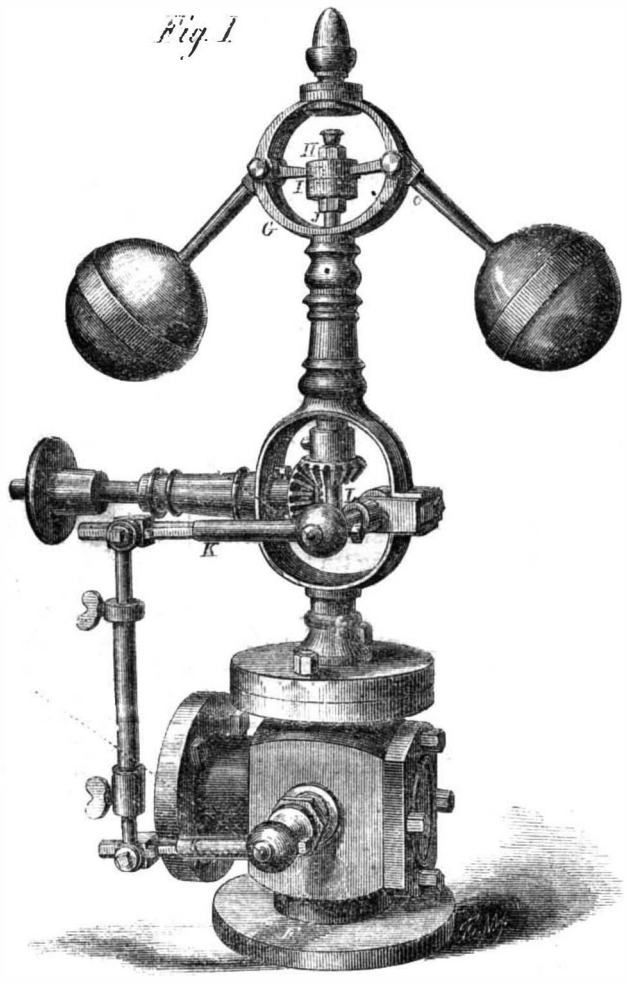

Fig. 1

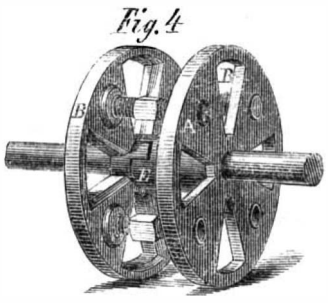

Fig. 4

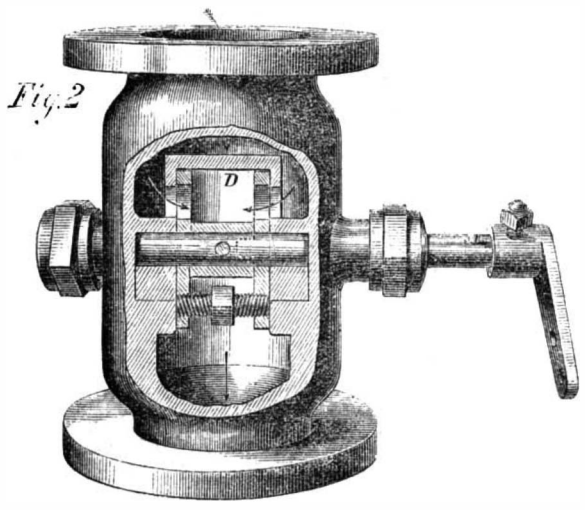

Fig. 2

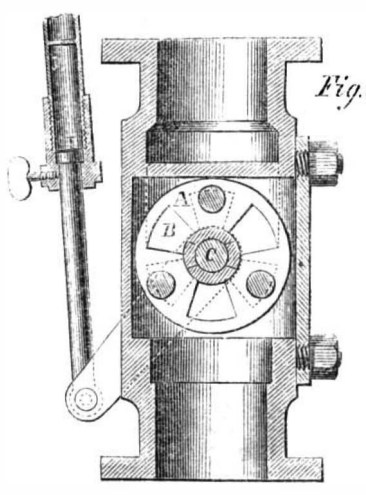

Fig. 3

WHITE'S BALANCED GOVERNOR VALVE.

CROOKES ON DISINFECTANTS.

William Crookes, F.R.S., editor of the London *Chemical News*, is a man of world-wide fame from his valuable contributions to chemical science, including the discovery of a new element. Since the appearance of the cattle plague in England he has devoted a great deal of attention to the study of disinfectants, and was finally appointed by the Royal Commissioners to make an elaborate investigation of the subject. His report is published in the *Chemical News*, and it is certainly the most valuable document in relation to disinfectants that has ever appeared. It revolutionizes the practice. It shows that the substances now principally relied on, and employed, have little or no effect in destroying infection, and it points out materials that are really efficacious. Could its conclusions be generally known and acted on, it might save thousands of animals from the rinderpest, and thousands of human lives from destruction by cholera. We regret that our want of space prevents us from laying it in full before our readers.

Mr. Crookes devotes the first portion of his report to the discussion of the nature of the infection, and he comes to a conclusion that it is *virus*, which he defines as the seed or germ of an organism, either animal or vegetable, having the power to grow and propagate its kind. Among the arguments in support of this view, perhaps the strongest is the extremely minute quantity of the matter that is sufficient to destroy a herd of cattle.

As a result of this theory, the distinction is clearly drawn between *deodorizers* and *antiseptics*—deodorizers merely removing the harmless smell, while antiseptics kill the germ. We extract some of the paragraphs in relation to this part of the subject:

I am bound to admit that the conclusion to which I have been forced to come, is quite opposed to my preconceived ideas on the subject. I started with a strong bias i favor of chlorine ar ozone, but the irresistib force of the argumen derived from my expe ments, has caused me alter my opinion.

At first sight nothi appears more perf than the action of a po erfully oxidizing dis fectant, like chlorine ozone, upon noxious por and septic germs. presence of an excess of either of these agents, all organic impurity is at once burnt up, and reduced to its simplest combinations; and could we always rely upon the presence of a sufficient amount of either of these bodies, no other purifier would be needed. But in practical work on a farm these disinfectants were always very inadequate, except perhaps for half an hour or so during the day; at other times, the oxidizing agent has presented to it far more noxious material than it can by possibility conquer, and being governed in its combinations by definite laws of chemical affinity, the sulphureted and carbureted hydrogen, the nitrogen and phosphorus bases, etc., would all have to be burnt up before the oxidizing agent could touch the germs of infection; while the continued renewal of the gases of putrefaction would be perpetually shielding the infectious matter from destruction

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It is here that the great objection lies to disinfectants which act by oxidation. If we arrange in a series (as set forth in par. 12) the possible substances which may be met with in an infected shed, and gradually mix with them chlorine or ozonized air, we find that those vapors having strong and fetid odors, and which stand at the commencement of the list, are the first to go; while the actual virus of the disease—the organized particles which have no odor whatever—are the last to be attacked. But in using disinfectants of this class, the only test of efficiency which a workman would employ is the sense of smell, and I have on several occasions known it happen that a deodorized shed, to all outward appearances disinfected, was still in reality saturated with infection. It so happens that the stinking gases of decomposition are of little or no danger in the atmosphere, while the deadly virus cells of infectious diseases are inappreciable to the sense of smell. Mere deodorization is therefore no protection whatever.

The following experiment tends to illustrate, if not to prove this:—Cheese mites were put into water mixed with strongly smelling cheese and sulphureted hydrogen. Aqueous solution of chlorine was gradually dropped into the mixture from a burette. The smell of sulphureted hydrogen was the first to go, then some smell of cheese, but it required a considerable quantity of chlorine to kill the mites. Exactly the same experiment was now repeated, only leaving out the sulphureted hydrogen and cheese. The chlorine now had nothing to divert its energy from the cheese mites, which were consequently killed before one-fourth the quantity of chlorine used in the first instance had been added.

Again, oxidizing disinfectants possess little if any continuous action. What they attack is destroyed perfectly, but what they leave has no special resistance to decomposition conferred upon it. They remove the products of decomposition, but they do not take away the power of further putrefaction.

Oxidizing disinfectants produce their effect by actually destroying infecting substances. Antiseptics act simply by destroying their activity. The former act more energetically upon dead than living organic matter. Antiseptics attack first the opposite end of the scale, and destroy vitality; they exert little or no action on the foul smelling and comparatively harmless gases of decomposition, but they act with intense energy on the inodorous germs of infection which these gases may carry into the atmosphere along with them.

If, therefore, the theory which I started be correct; if the matter which conveys infection from one animal to another be of the nature of an organized germ; if it owes its tremendous powers of destruction to the presence in it of vitality, then antiseptics are the only agents fitted to deal with this special case; for they leave almost untouched the crowd of simply odorous gases, and seek out and destroy the one thing to be feared. When I treat of carbolic acid, ample proof of the correctness of this view will be given.

The results of a long series of experiments are given, and the conclusion seems to be that chlorine, chloride of lime, ozone and other substances which have been recommended on very high authority, and almost universally employed, are of little if any value in arresting the spread of the disease, and that the two most efficient substances for this purpose at present known are sulphurous acid and carbolic acid. Among the experiments were the following:—

Other experiments were then instituted in the endeavor to understand more clearly the mode of action of carbolic acid.

IX. Some meat was hung up in the air till the odor of putrefaction was strong. It was then divided into two pieces; one was soaked for half an hour in chloride of lime solution, and was then washed and hung up again; the offensive smell had entirely gone. The other piece of meat was soaked in a solution of carbolic acid containing 1 per cent of the acid; it was then dried and hung up. The surface of the meat was whitened, its offensive odor was not removed, though it was masked by the carbolic acid. In two days' time the bad odor had quite gone, and was replaced by a pure but faint smell of carbolic acid. In a few weeks' time the pieces of meat were examined again. The one which had been deodorized with chloride of lime now smelt as offensively as it did at first, while the piece treated with carbolic acid had simply dried up, and had no offensive odor whatever. It was then hung up for another month and examined; no change had taken place.

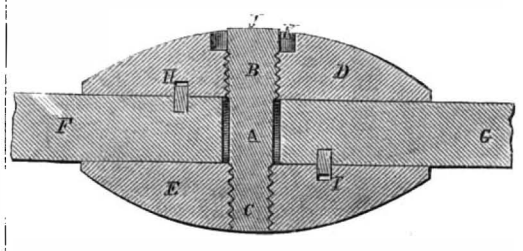
X. A piece of fresh meat was soaked in a 1-per-cent aqueous solution of carbolic acid for one hour; it was then wrapped in paper and hung up in a sitting room in which there was a fire almost daily; at the end of ten weeks it was examined. It had dried up to about one-fourth of its original size, but looked and smelt perfectly good and fresh, a very faint odor of carbolic acid being all that was perceptible. It was soaked for twenty-four hours in water, and then stewed with appropriate condiments and eaten; it was perfectly sweet, and scarcely distinguishable from fresh meat, except by possessing a very faint flavor of carbolic acid, not strong enough to be unpleasant.

These are important experiments. They point out in a striking manner the difference between mere deodorizers and antiseptics. Hitherto attention has been almost entirely confined to the deodorization of gases arising from putrescence. The effect has been combated, while the removal of the cause has received scarcely any attention. Chloride of lime, one of the strongest of the class of deodorizers, acts, as has been shown, only on the gases of existing putrefaction, but it has no influence over the future. Carbolic acid on the other hand, has scarcely any action on fetid gases; but it attacks the cause which produces them, and, at the same time, puts the organic matter in such a state that it never re-acquires its tendency to putrefy.

The same substances that would kill the germs of the rinderpest, would doubtless destroy those of the cholera.

RUGGLES'S SHAFT COUPLING.

There are some mechanical powers which, because of not being of universal or general application, are seldom used and recognized, but which are of a most important and valuable character. Such is the differential screw, which is rarely used, but which, in certain instances, is the strongest grip known in mechanics. This has been applied in the above improvement very effectively. A brief description will easily explain this device.



A is a differential screw bolt having two threads, that on the upper portion, B, being ten to the inch, and that on the lower part, C, nine to the inch. The head, J, of the bolt is six-sided, and is flush with the surface of the box. It is seated in the circular recess, K, which is large enough to receive on the end a cylindrical or socket wrench. D is the upper half, and E the lower half of a box made to fit the shafts, F and G. Threads corresponding with those on the two portions of the bolt are tapped in the boxes.

The above is sufficient to explain to any practical man the operation of this device. It will readily be seen that a few turns of the screw will be sufficient to clamp the shaft ends in a grip the power of which is limited only by the strength of the material. Two steady pins, H and I, are inserted in the shaft and project into holes drilled into the coupling boxes to provide against negligence in setting up the screw, thereby allowing the shaft to turn. The annexed engraving is a vertical section.

This is evidently a valuable and efficient coupling. It presents no nuts or bolt heads to catch belts or clothing, obviates the necessity of keys and splining, cannot get out of order, and presents a neat appearance, when turned and polished, looking nearly like the enlargement of the shaft.

This invention was patented April 24, 1866. For further information address S. P. Ruggles, No. 152 Washington street, Boston, Mass.

Useful Plants.

A German author states that the number of useful plants has risen to about 12,000, but that others will no doubt be discovered, as the researches yet made have been completed in only portions of the earth. Of these plants there are 1,350 varieties of edible fruits, berries, and seeds; 103 cereals; 37 onions; 460 vegetables and salads; 40 species of palms; 32 varieties of arrowroot, and 31 different kinds of sugars. Vinous drinks are obtained from 200 plants, and aromatics from 266. There are 50 substitutes for coffee, and 129 for tea. Tannin is present in 140 plants, caoutchouc in 96, gutta-percha in 7, rosin and balsamic gums in 389, wax in 10, and grease and essential oils in 330; 88 plants contain potash, soda, and iodine; 650 contain dyes, 47 soap, 250 weaving fibers; 44 fibers used in paper making; 48 give roofing materials, and 100 are employed for hurdles and copses. In building, 740 plants are used, and there are 615 known poisonous plants. One of the most gratifying developments, is that out of 278 known natural families of plants, there are but 18 species for which no use has yet been discovered

Gun-Paper.

Mr. G. S. Melland, of Lime street, London, who has distinguished himself among British makers of fire-arms, has recently invented a "gun-paper" to supersede the old gunpowder. The invention consists in impregnating paper with a composition formed of chlorate of potash, nine parts; nitrate of potash, $4\frac{1}{2}$; prussiate of potash, $3\frac{1}{4}$; powdered charcoal, $3\frac{1}{4}$; starch $\frac{1}{12}$th part; chromate of potash, $\frac{1}{16}$th part; and water 79 parts. These are mixed and boiled during one hour. The solution is then ready for use, and the paper passed in sheets through the solution. The saturated paper is now ready for manufacturing into the form of a cartridge, and is rolled into compact lengths of any required diameter. These rolls may also be made of required lengths, and cut up afterward to suit the charge. After rolling, the gun-paper is dried at 212 deg. Fah., and has the appearance of a compact grayish mass. Experiments have been made with it, and it has been reported favorably of, as a perfect substitute for gunpowder, superseding gun-cotton and all other explosives. It is said to be safe alike in manufacture and in use. The paper is dried at a very low temperature. It may be freely handled without fear of explosion, which is not produced even by percussion. It is, in fact, only exploded by contact with fire, or at equivalent temperatures. In its action it is quick and powerful, having, in this respect, a decided advantage over gunpowder. Its use is unaccompanied by the greasy residuum always observable in gun barrels that have been fired with gunpowder. Its explosion produces less smoke than from gunpowder; it is said to give less recoil, and it is less liable to deterioration from dampness. It is readily protected from all chance of damp by a solution of xyloidin in acetic acid. The xyloidin is prepared by acting on paper with nitric acid, one part thereof being dissolved in three parts of acetic acid of specific gravity of 1,040.

In experimenting with this new explosive substance, six rounds were first fired with cartridges containing 15 grains of gunpowder, and a conical bullet, at 15 yards range, which gave an average penetration of $1\frac{1}{16}$ into deal. Six rounds were then fired with 10 grains of gun-paper and a conical bullet at same range, and gave an average penetration of $1\frac{3}{8}$ into deal. Here was 33 per cent less of paper than powder, and greater penetration with paper. Six rounds followed with an increased charge of 15 grains of gun-paper and a conical bullet, at the same range, and at each shot the bullet passed through a 3-inch deal. At 19 yards range, 12 grains of the paper, fired from a pistol of 54 gage (44-inch), sent a heavier bullet through a 3-inch deal. A fouled revolver was preserved four days, but betrayed no symptoms of corrosion after using gun-paper. It is expected that gun-paper will be manufactured cheaper than gunpowder.—*London Artizan.*

Growth of Our Navy.

In 1783 our navy consisted of four vessels; in 1815 of 276, carrying 1,636 guns; in March, 1865, we had 684 vessels with 4,477 guns. These comparisons of numbers of ships and guns, however, do not fairly represent our progress in naval power. What comparison can be made between a frigate or line-of-battle ship of fifty years ago, with its wooden sides, heavy spars, dependence upon wind for maneuvering, and battery of eighteen, thirty-two, and forty-two pounders, and a monitor of impenetrable iron, moved independent of wind or tide, and armed with a battery of four fifteen-inch guns!

DEPTH OF MILK FOR CREAM.—A correspondent of the Boston *Cultivator* says that the form of the vessel containing milk, from which it is intended to collect the cream, does not affect the quantity of cream raised. He says: "desiring to test this matter, I took glass cream jars, in which were graduated scales, and set milk at different depths, from 2 to 18 inches. The depth of cream was always in proportion to the quantity of milk."

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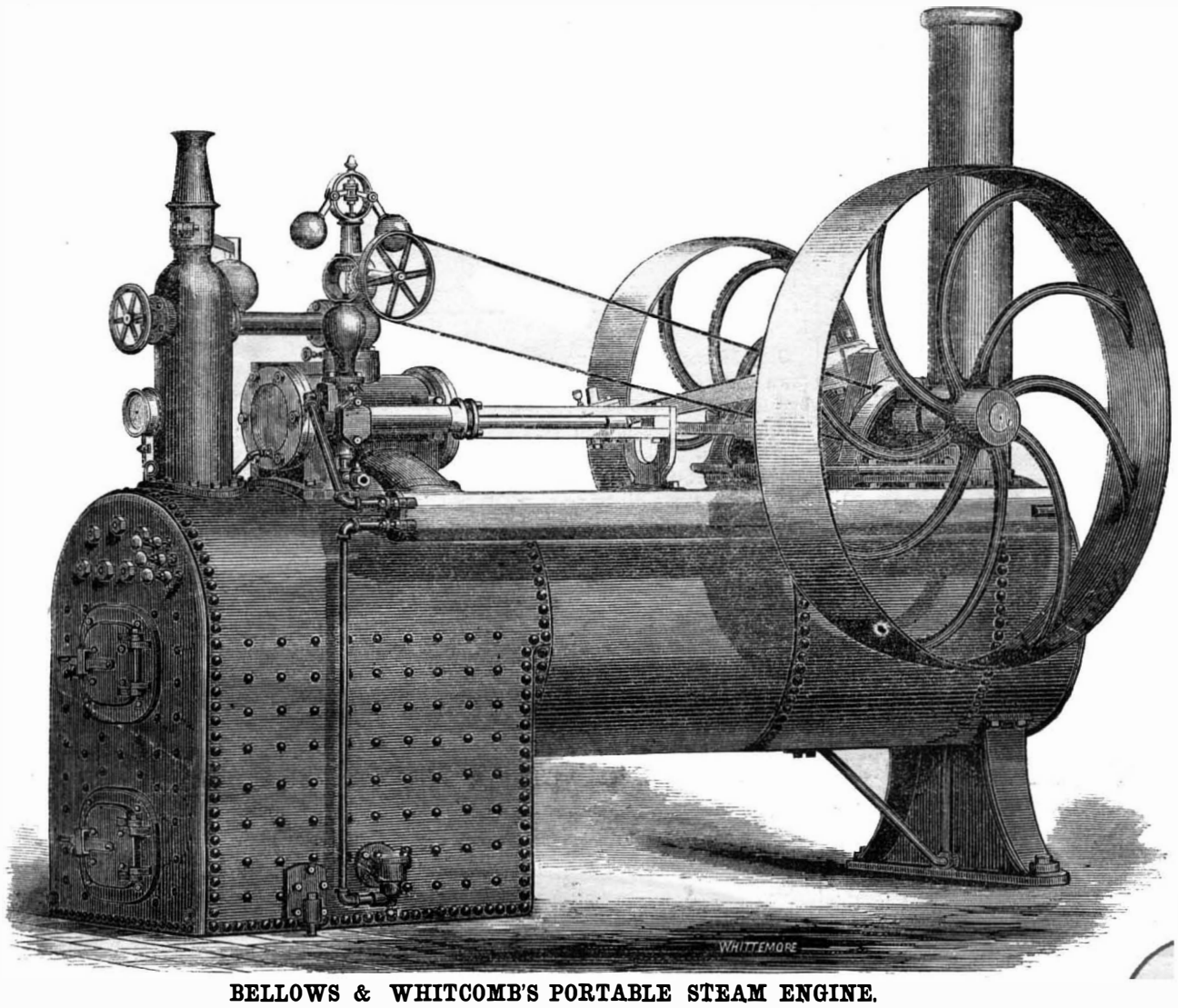
Improved Portable Steam Engine.

Within a few years the steam engine, in portable form, has become a favorite motor, being used even for purposes requiring fifty horse-power. The unusual demand for these handy and easily-managed engines has greatly stimulated the builders to add improvement after improvement, until they may be considered as near perfection as any machine in general use.

The illustration gives a perspective view of a very excellent engine, manufactured by Bellows & Whitcomb, Worcester, Mass. The builders claim that these engines furnish the maximum of power with the minimum of fuel. The cranks and connecting rods are of the best forged iron, the workmanship is of first-class quality, and every plate used in the boiler is thoroughly tested before being used. A patent steam piston packing and an improved governor, of their own invention, is believed to give better results than any others in use. Each machine is tested by actual working before it leaves the manufactory, and is guaranteed to work to the full power at which it is rated. The engines are furnished complete, ready for operation, with the exception of pipes and belting, which will be provided if desired. For further information address as above.



BELLOWS & WHITCOMB'S PORTABLE STEAM ENGINE.

THE WAR POWERS OF EUROPE AND AMERICA.

The strength of the three European countries now arming for strife is thus stated:—Austria, square miles, 236,311; population, 36,795,000; army, 800,000. Prussia, square miles, 108,212; population, 19,304,000; army, 700,000. Italy, square miles, 98,784; population, 21,703,710; army, 400,000.

The Northern States of this Union contain about 20,000,000 of inhabitants, and at the close of the war our army numbered 1,000,500 men.

The military power of nations, however, is by no means in proportion to their population, or to the size of their armies at the opening of the contest. When numbers so large are enlisted, the element that mainly determines the victory is the continued ability to support the armies, and this depends upon the nation's capacity for producing wealth. Soldiers must be supplied with food, clothing, military munitions, and appliances. During the first months of a war these may come from the accumulations in the granaries and warehouses, but for the maintenance of armies through repeated campaigns, there must be a continued surplus production of them beyond the needs of that portion of the population which continues in peaceful pursuits.

The war in this country for the suppression of the rebellion cost the nation 3,500 millions of dollars, and a portion of this was drawn from the personal property that we had on hand when the war broke out. The merchandise in our warehouses, the grain in our cribs, and the cattle in our fields, were probably less in quantity at the close than they were at the beginning of the war, but the quantity was not diminished to the extent of 3,500 millions of dollars. According to the census returns, we were accumulating wealth immediately before the war at the rate of more than 900 millions of dollars per year. This rapid accumulation was checked by the withdrawal of a million of men from productive labor to unproductive consumption, but it was not stopped. Indeed, it may be an open question whether the general introduction of the reaping machine, the sewing machine, coastwise propellers, and other agencies for facilitating the production of wealth, did not fully counterbalance the withdrawal of the soldiers from peaceful industry. There are many farmers, manufacturers, and traders, who have as large stocks as they had before the war, and who have besides some Government bonds—these bonds having been bought with the profits of their business during the war; in other words, their surplus products have been furnished for the support of the armies.

Now, the production of wealth in proportion to the population is two, or three, or four-fold greater in this country than it is in either of the European countries that are now going to war. The Prussian manufacturer of scissors has the iron and steel of his articles carried from fifteen to twenty miles on the heads of his workmen, during the process of manufacture, and the labor is unaided by water or steam. The consequence of this unwise direction of industry is, that the skilled mechanic produces but forty to fifty cents per day of value when measured in the markets of the world. The American mechanic, by calling to his aid the forces of nature and innumerable ingenious appliances, is able to produce value to the amount of three or four dollars every day that he works.

This great ability to produce wealth gives the people of this country the power to maintain armies, and thus endues them with military strength in proportion to their numbers—probably not less than three-fold that of any other nation, with the exception of Great Britain. This power we owe to the intelligent use of productive machinery, and for the extent of this use we are indebted to our free institutions, our common schools, and our patent laws.

INTERESTING TO OIL MEN AND MINERS.

In Vol. XII., No. 23, we gave an illustration and description of an apparatus for pumping oil wells and mines, patented by F. S. Pease of Buffalo. Last week we had an opportunity of witnessing its operation by working models on a large scale, and we are satisfied, after a lengthy investigation, that the improvement is one of great importance.

Its negative advantages are, that it dispenses with all pump rods; has no apparatus in the bottom of a deep well which can get out of order, can pump and lift gas, atmospheric air, water, oil, or paraffine, and can act in any position, the pipe turning corners at all angles. Its positive advantages are certainty of action, using the pipes already down in oil wells, the creation of an efficient vacuum, and the ease and economy of its application.

It has been subjected to severe tests and never yet has failed. Indeed, its performance exceeds the promise of the inventor. The lowest estimates made by practical and scientific men, who have examined its operation, is that it is equal to at least 2,200 barrels per day through a two-inch pipe, 4,090 from a two-and-a-half-inch pipe, and 8,200 barrels through a three-inch pipe. The depth of the well or mine does not prevent its efficient action.

The principle of its operation is that of forcing compressed air down a tube, exhausting the air

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chamber, and thus forcing the contents of the well into the vacuum, whence it is discharged by the combined action of the compressed air and the pressure of the atmosphere acting on a vacuum. The same apparatus can be used for separate wells, or mines, there being always a surplus of power for contingencies. It has been applied to house pumps and works admirably, the pump never fouling nor freezing.

Those interested are referred to the description in No. 23 of Vol. XII., SCIENTIFIC AMERICAN, or to F. S. Pease, Buffalo.

New Steamboat Fuel.

The Cleveland (Ohio) *Herald* says:—"The other day, at the Islands, we noticed a novel kind of steamboat fuel. When the *Philo Parsons* was wooding at North Bass Island, she took on board a large number of sturgeon which had been landed from the fish ponds in that vicinity. As these fish had been lying a day or more in the sun they were, like the exploded dog, not good for much as fish. Curiosity as to the design of such freight was soon satisfied on seeing a huge sixty-pound sturgeon go head foremost into the furnace. Inquiring into this novel species of steamboat fuel, we were told that the oil from the fish assists the combustion of the wood very much, and that the boatmen are glad to clear the docks of sturgeon, which would otherwise be deemed worthless, unless to enrich the soil.

"It is said twenty sturgeon make as much steam as a cord of wood, though we do not know that the wood-measure tables have been 'reconstructed' so as to read, 'a score of sturgeons make one cord.'"

Low's Shingle Machine.

In the description of Low's shingle and barrel head machine, which was illustrated in No. 25, Vol. XIV., SCIENTIFIC AMERICAN, an error occurred in regard to its capacity. Instead of sawing from 1,700 to 2,500 shingles per day of eleven hours, we have seen certificates from concerns using the machines which state that they cut from 15,000 to 22,000 per day of ten hours, and that they are capable of doing even more. These machines are in use in all the Western States, in California, and in New Brunswick. They seem to give excellent satisfaction. For the convenience of our readers interested in the lumber manufacture we give the prices: with 36-inch saw and jointer, complete, $275; with 40-inch saw, $300. S. J. Ahern, 88 Wall street, is the agent in this city.

The Non-Recoil Gun.

It will be recollected that in our last number we stated the facts, in brief, in regard to experiments with an open tube as an instrument for propelling projectiles. The *Engineering* states that "Mr. Harding, the inventor, has brought it under the notice of the French and Belgian Governments, who have each appointed a commission to examine and report upon its merits. Mr. Harding is drawing, at the Hydraulic Tube Company's Works, a gun of 4-inch bore with 2-inch thickness of steel around the chamber, and we hope soon to be able to give the practical results of a conclusive trial of the most extraordinary system of ordnance known to modern times." The result of experiments on a scale that promises useful and practical effects will be awaited on this side the water with a degree of interest noways inferior to that of our cousins on the other side.

The Ames Gun.

Mr. Horatio Ames, the patentee and manufacturer of the gun which bears his name, and which has been repeatedly tried with extraordinary results by the ordnance officers of the American Government, has lately brought it under the notice of the Emperor of Russia. The resources of the Russian gun factories were at once placed at Mr. Ames's disposal, together with a liberal appropriation of money to establish the manufacture in that country; but, we believe, the offer has been declined, and indeed no experienced iron-master would think of commencing such an undertaking in a country so lacking in skilled labor and in general facilities for special manufactures of iron as Russia.—*Engineering.*

DURING the war over one thousand ships of our mercantile marine were transferred to foreign flags.

MISCELLANEOUS SUMMARY.

THE Hamilton Manufacturing Company, of Lowell, has entered upon a new department of business, that of manufacturing delaines. The machinery for this purpose was mainly imported from England at a cost of $400,000, and the company is now able to turn out delaines that will not suffer from comparison with the products of older concerns. The manufacturing companies of Lowell have introduced into their mills Francis's apparatus for extinguishing fires—by which the entire building can be flooded in a very brief period of time, and which can be effectually operated when it would be impossible to affect the flames by efforts from the outside.

THE people of St. Louis are again bestirring themselves to an extension of the North Missouri Railroad through Iowa via Cedar Rapids and into Minnesota, so as to tap the seven east and west lines in those States, and afford an easy and effectual cut-off for the benefit of St. Louis. They have hitherto relied upon the Mississippi as a cut-off, but are abandoning that idea with the multiplication of railroad bridges over the stream, and now propose a subscription of a million dollars in aid of a railroad extension to Cedar Rapids.

OLD MINES RE-DISCOVERED.—In Brazil, in the town of Rio Grand de Sul, old silver mines worked by the Jesuits have been re-discovered. There are said to be in the southern part of California, also, silver mines of the greatest richness which were worked before the formation of the Mexican Republic with great results, all traces of which were carefully concealed when the priests, who had taken the profits of them, were compelled to leave the country. The Indians were put under oaths, with fearful penalties, not to disclose the locations of them.

A VEIN of tripoli, twenty feet in thickness, fifty rods wide, and a mile in length, has been discovered near the town of Stillwater, Minn. It is said to be free from acids, mica, or calcareous earths, and equal to the Mount Eagle tripoli, so celebrated in this country and Europe. Nothing has ever yet been discovered equal to the pure tripoli for cleansing and burnishing all metallic and glass surfaces. Tripoli is composed of the exuviæ of infusoria, and is entirely an animal production, although found in the earth.

CRYPTOGRAPHY.—C. B. S., of Conn, sends a table intended to be used in cipher writing, which is precisely like one sent us by an Ohio correspondent, and which we referred to in No. 25, Vol. XIV. Like that, its value depends upon key words agreed upon by the parties in communication, and it is one of the most ancient forms of the art. An arbitrary transposition of the letters, guided entirely by the key words, constitutes its value.

THE city of Hartford, Conn., has produced no less than 821,000 volumes of books relating to the civil war, whose aggregate value is about $2,500,000; turned out more fire-arms than any other city, and built $1,500,000 worth of steam engines during the war.

MR. HUGHES gets for his telegraph 200,000 francs from France, 120,000 francs from Italy, and something from Russia, besides the Order of St. Anne. He can afford to frank a few dispatches for his friends—he can if any man can.

IT is stated that New Haven is the only place in the United States where fishhooks, needles, and steel-bowed spectacles are manufactured. Needles, however, are now made in Bridgeport and other places.

A NEW HAVEN company has begun the manufacture of a compressed stone for building purposes. It is made of sand, pulverized quartz, and silicate of soda, and hardens within 24 hours from the consistency of putty to the solidity of stone.

LEWISTON, Me., has eight cotton factories, with eighty thousand spindles and five thousand operatives. The mills are now all running on full time. The Androscoggin Mill there is one of the largest in the world.

THE first bushel of wheat ever grown in Minnesota was raised in 1829; last year the yield was 10,000,000 bushels; and this year, with a good harvest, the crop is put down at 16,000,000 bushels.

THE Jewish synagogue just completed at Berlin, but not yet consecrated, is one of the most gorgeous buildings in Europe. The entire cost of the structure is estimated at $750,000 in gold. It is surmounted by a huge dome of the Oriental type, which can be seen from every house-top in Berlin. It is not less conspicuous for its Eastern form, than for the heavy gilding which covers it in every part. Besides, there is also a minor dome, also richly gilded. The interior is broken up into the great central hall of worship, not far from a hundred feet in length, and provided with 3,000 chairs for the worshipers. These are of oak and richly carved. To occupy one of these chairs costs about $500 yearly.

ODORS OF DISEASE.—The odor of small pox has been compared to the smell of a he-goat; that of measles to a fresh-plucked goose; scarlatina to cheese. The smell of plague has been compared with the odor of May flowers, and that of typhus with a Cossack. That the typhus odor resembles ammonia, I have often observed, and the best and most recent investigators agree that it is a compound of ammonia. Probably the more intense the smell, the more operative the poison; hence the necessity on the part of the attendant to avoid inhaling this concentrated poison.—*Prof. Banks, Medical Press and Circular.*

THE origin of the earth's heat is the subject of a communication from H. L. of N. Y. He assumes it is caused by the impact of the earth upon whatever resisting medium in the line of its orbit tends to retard its motion. The idea is not new, and the subject is not really of practical importance. Until the existence or nature of a resisting medium is established and understood, all discussion of the question must partake more or less of conjecture.

A NEW PRESIDENTIAL MANSION.—It is proposed in Washington to erect a new dwelling for the President on the elevated plateau at the east of the Capitol, the present White House being deemed unhealthy and inconvenient. Probably the cost of building a roomy and permanent structure in the locality proposed would be hardly more than the expense of the continual repairs which seem to be required on the present edifice.

MEASURING GRAIN.—The variation between weight and measure of grain in different States has induced the Albany Board of Trade to recommend to the Boards represented in the Detroit Commercial Convention of 1865, the measurement of grain by the cental of one hundred pounds, with the object of uniformity.

THE grounds of the Portland Rolling Mills Corporation comprise eighty-five acres. This tract is divided by avenues into lots, and with a multitude of neat and substantial houses constitutes a pleasant little village. The mill has a capacity of 10,000 tuns per year, has an engine of 400-horse power, seven heating and three puddling furnaces.

IN speaking of city reforms, some weeks ago, we alluded to the fact that the new Excise Board intended to get enough from licensed liquor dealers to nearly pay the police expenses of the city. This Board went into operation on the 1st of May, and the Treasurer now reports over one million dollars on hand.

THE new bridge over the Schuylkill at Chestnut street, Philadelphia, is rapidly approaching completion. It is a splendid structure of cast iron, the total weight of the material being seventeen hundred and fifty tuns. It will be opened for travel July 4th, and will be entirely finished in the ensuing September.

AN exchange says that a sure sign of rain is the rising of moisture to the surface of the ground where it has before been dry, and accounts for it by the fact that as a storm approaches, the density of the atmosphere decreases, and the pressure upon the surface of the earth is lessened.

STEEL RAILS.—In consequence of being made too hard, several steel rails have broken lately. It is imprudent to attempt to obtain great durability by making over-hard steel. In the cases to which we refer, the engine weights were very heavy.

WATER in which indigo has been dissolved is recommended to remove smoke stains from walls before whitewashing, but common lye made from wood ashes is believed to be equally as efficacious

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THE SCIENTIFIC AMERICAN---COMMENCEMENT OF VOLUME XV.

This is the initiatory number of Vol. XV., new series, and with it we send greeting to our numerous subscribers. What the SCIENTIFIC AMERICAN has been in the past is our readers' assurance of what it will be in the future. We might fill columns with the favorable notices we receive, not only from our exchanges, but by private correspondence, but we prefer that our works speak for themselves.

We design to sustain the character of this journal as a means of instruction and improvement, and a medium through which the student of practical science, and the mechanic, can reach those devoted to kindred pursuits.

The results of experiments in science as applied to the useful arts; the details of mechanical improvements; the successive triumphs of mind over matter; the discussion of questions involving valuable principles and their useful application; the furnishing of practical information desired by correspondents; illustrations and descriptions of new inventions, and a general *resumé* of the progress of science and art, are among the objects of the SCIENTIFIC AMERICAN.

We remind our subscribers that now is the time for renewing their subscriptions, as, after the lapse of a few weeks, it is often difficult to furnish the back numbers. The same remark applies equally to those designing to become subscribers.

Iron-clad Ships.

In reply to a question put by Mr. Laird, in the House of Commons, the other evening, Mr. T- G. Baring said: "Her Majesty's Government are 'aware that there are several ironclads belonging to foreign Governments on the Pacific and North American stations,' and that some of those vessels carry cast-iron guns which throw very heavy shot. With respect to the future movement of her Majesty's armor-plated ships, I must beg to be allowed to say that they must be determined from time to time by the Executive Government. I may mention, however, that the *Favorite* has been sent on an experimental trip to the North American station. Twelve-ton guns have not yet been placed on board any armor-plated ships. They have been found to work as well as broadside guns, have been adopted into the service, and will be supplied to our armor-plated ships as soon as carriages are ready. The alterations of the *Scorpion* are being carried on precisely as all work is carried on which in not urgently required. They have only been interrupted by pressing demands on account of ships wanted for service, but I am afraid they are not likely to be completed for some considerable time.—*Engineering.*

Honors to Mechanical Engineering.

At the commencement of the University of the City of New York, held on the 21st at Niblo's Garden, the degree of Doctor of Physical Science (*Doctor Physicis Artibus*), was conferred upon Mr. Erastus W. Smith, the well-known engineer of Harlem Bridge and of various corporations. Mr. Smith is also superintending the construction of the *Dunderberg* for the Government contractor, Mr. W. H. Webb. This is the first instance of the conferring of this eegree in this country.

A NOTEWORTHY fact in connection with the present difficulties on the Continent is, that all countries likely to be engaged in the war have increased their supply of coal to an enormous extent. Italy has been importing coal lately in such large quantities that the freights on the east coast have greatly advanced, and vessels can scarcely take the coal with sufficient rapidity. This supply is for the Italian navy. Austria has also increased her supply of coal very largely, although it would appear that her navy is not to be actively engaged in acts of aggression upon Italian merchantmen. Prussia has also largely increased her supply, and the same remark will apply to Russia and France.

VESUVIUS GETTING LIVELY.—People who live in the neighborhood of Mount Vesuvius say that the volcano is again exhibiting signs of internal commotion. The small cone recently threw quantities of stones into the air, and on the large cone two new craters have been formed. A considerable body of lava has also flowed from the small cone.

NEW INVENTIONS.

REGISTERING APPARATUS FOR PRINTING PRESSES.—JAMES KIRK, Dover, Del.—In printing upon both sides of a sheet, whether for newspapers, books, or other work, it is essential that the impressions on the two sides of the sheet register; in order to effect this, pins or points are generally used in giving the second impression, to fit into holes made in the sheet at the time the first impression is given it. Several plans have been devised for facilitating the adjustment of the sheet upon the pins or points, and the withdrawal of the latter from the former, in feeding the sheets to the press for the second impression, and this invention relates to an improved means for accomplishing that object.

GAGE COCK.—C. L. FRINK, Rockville, Conn.—This invention consists in the arrangement of an elastic and flexible perforated valve, in combination with the hollow screw spindle of a gage cock and with a tapering seat, so that by forcing the valve down in its seat, the channel in it is closed and the escape of water or steam from the interior of the boiler is prevented; and by moving the valve back from its seat the central channel or passage in the same is opened and the steam or water from the boiler is free to discharge

SOCKET FOR WATER GAGES.—C. L. FRINK, Rockville, Conn.—This invention consists in the arrangement of a safety cock in line with the channel leading from the lowest socket of a water gage to the water space of a steam boiler, in combination with the ordinary blow-off cock at the bottom end of the socket, in such a manner that by opening the safety cock before the blow-off cock is opened a jet of solid water is forced through the socket at right angles with the bore of the glass tube, and thereby the steam is prevented from blowing through the gage when the blow-off cock is opened, and the danger of breaking the glass tube is avoided.

STREET RAILWAY CAR.—F. W. JENKINS, Brooklyn, N. Y.—The object of this invention is to prevent the occurrence of accidents to persons, who, by carelessness or mischance, happen to fall under the cars, across the rails, and in front of the car wheels, while the cars are in motion.

LANCING IMPLEMENT.—GEORGE J. CAPEWELL, West Cheshire, Conn.—This invention consists principally in a peculiar formed cap for the casing of the instrument in which the knife blade is arranged, whereby the instrument when placed upon the animal with such cap over the vein which is to be lanced, the vein will be firmly and tightly held in the proper position for the knife to act upon it.

WATCHES.—ARTHUR WADSWORTH, Newark, N. J.—This invention relates to that class of watches, for the winding and setting of which no key is required, and in which both operations are performed by simply turning a part of the pendant of the watch case.

WASHING MACHINE.—JOHN C. FELLOWS, South Adams, Mass.—The object of this invention is to produce a washing machine which will be economical in construction and easy to repair, and which is easily operated without requiring the expenditure of much power or much skill.

GANG PLOW.—JAMES B. HUNTER, Ashley, Ill.—This gang plow consists in an improved means for adjusting the plows, higher or lower, as may be desired, and also for adjusting them laterally, whereby furrows of greater or less depth and width may be made, in an improved means for raising the plows out of the ground, as is necessary in drawing the machine from place to place, turning at the ends of a field, etc., and in an improved means for adjusting the points of the shares more or less obliquely in a downward direction, and in an improved manner of attaching the plow beams to the machine in order to lighten the draft.

SNAP-HOOK.—A. HAGNY, Keokuk, Iowa.—This invention consists in a snap-hook which is cast with an eye of considerable size through its shank, and with points in its under side, which points are to be turned down to secure the spring to the hook, the spring passing through the eye and springing in a recess cut for it in the extreme end of the hook, by which construction it is believed that much is saved in material and expense of casting and fitting the parts.

SHOVEL PLOW.—PAUL DENNIS, Schuylerville, N. Y.—This invention consists in the employment of adjustable wings of twisted or curved form, applied to the plow in such a manner as to be capable of being reversed or changed in position from one side of the plow to the other, in order to cast the earth outward from the plow, or inward to fill the furrow.

BOLT-HEADING MACHINE.—A. B. GLOVER, Derby, Conn.—This is a machine for forming heads on bolts and consists in a novel arrangement of forming dies in connection with two upsetting dies, whereby the heads of bolts may be perfectly formed, and by an automatic movement of the several parts throughout the whole operation. The heading dies are so operated as to be brought consecutively over the bolt and forced down consecutively on the bolt, and the finishing heading die made to operate twice upon the bolt in order to finish the head. Means are employed for actuating the holding dies so that the bolt and screw may be firmly held during the heading operation, and instantly released after such operation is performed. It also has a clutch-operating mechanism for automatically disconnecting from the driving shaft as soon as the heading operation is completed.

BOOT AND SHOE STRETCHER.—WILLIAM FREDERICK, Ashland, Pa.—By means of this instrument boots and shoes may be stretched either at the toe or instep, or in both places at the same time. It consists of a stretching last, formed in two parts, hinged together at the toe by a treble-jointed hinge, and operated by a rod, pinion wheel, rack and pulley, or pulleys, for the purpose of stretching the toe of the boot or shoe.

FAUCET OR STEAM VALVE.—RUSSEL BURTON, South Adams, Mass.—The object of this invention is to furnish a faucet for restraining or permitting the passage of liquids or steam through a pipe; and consists of a conical chamber formed on said pipe and extending both above and below it, having a conical plug fitting into it, being pushed up against the cover by the action of a sprin making it steam-tight, and the wear being compensated by forcing down the plug by means of a screw cover.

RAILROAD SPITTOON.—W. G. SMITH, Carlisle, Pa.—This invention consists of a self-cleaning spittoon, which is let into the floor of the car, and the bottom and cover of which are so connected that closing the cover opens the bottom and discharges its contents, and opening the cover closes the bottom and leaves the spittoon ready for use.

CUTTING GREEN CORN.—JONATHAN BURT AND LEONARD F. DUNNE, Oneida, N. Y.—This invention relates to a device for cutting green corn from the cob, whereby the work may be quickly performed, and in a perfect manner. It consists of a series of cutters, scrapers, and guides, attached to a tube, and used in connection with a sliding frame provided with an adjustable center rod.

STRAW CUTTER.—CLARK POLLEY, Sinking Springs, Ohio.—This straw cutter is so constructed that the knife is forced up against the bed plate while making the cut, by direct pressure, thus compelling it to make a clean cut.

SMUT MILL.—R. C. SWANN, Brownsville, Ind.—This smut mill or scouring device is for the purpose of cleaning grain, and can be applied to an ordinary farming mill, thrashing machine, or fitted up in a flouring mill. It consists of a perforated bed or screen, having a reciprocating motion imparted to it, and a series of fixed pressure rollers having the bearings of their journals in springs, which cause the rollers to press upon the screen, the roughness of the latter in connection with the surfaces of the rollers, which are also rough, subjecting the grain as it passes over the screen to a sufficient scouring action, which loosens or detaches the smut and dirt.

FERRY BRIDGE GATE.—LEWIS P. DECKER, Brooklyn, N. Y.—This ferry bridge gate is so constructed as to be operated simultaneously and from any convenient position. It consists in the construction and arrangement of the gates, and the combination of a ratchet bar and gear wheels with each other, and with the shafts to which the gates are attached.

MACHINE TO MAKE HINGES.—JEAN BAPTISTE EVRARD AND JEAN PIERRE BOYER, Paris, France. (A. Berthoud, 248 Canal street, New York, is the assignee).—This machine is for manufacturing butt hinges, made of two halves, each half being made of a piece of sheet metal cut out and doubled up, so as to form loops through which the wire can be passed that serves to unite the two halves of the hinge. The two strips of metal required for the two halves of the hinges are fed automatically to the punches, to the cutters, and to the devices for doubling up the pieces forming the loops, pushing the two halves together, inserting the wire and cutting off the same; and, furthermore, a carriage is applied which forms the bearings for a series of countersinks placed in such a position that by their action all the holes in each hinge are countersunk simultaneously, and the hinges on being delivered from the machine are complete and ready for immediate use.

APPARATUS FOR KNEADING DOUGH.—GEO. W. SANDERS, Springfield, Vt.—This invention consists in combining a kneading board and roller in such manner that the roller may have a universal motion, whereby a convenient and easily operated device for kneading dough is produced.

GAVEL-DISCHARGING DEVICE FOR HARVESTERS.—WILLIAM ZIMMERMAN, Oskaloosa, Iowa.—This invention relates to a new gavel-discharging device for harvesters, whereby gavels of greater or less size may be discharged, as desired, and the device made to operate with certainty and in a perfect manner. It is designed to operate in connection with an endless apron, a means used on some harvesters for discharging the cut grain from the machine.

SILL STRIP FOR DOORS.—JEREMY E. LINDSLEY, Goshen, Ind.—The object of this metallic strip is not only to protect the sill from becoming worn, but also to prevent rain or moisture or the wind from passing under the door, thus also acting as a weather strip; it being so formed that it can be applied to the sill of the door and there retained in place without the use of screws or other fastening devices.

IRRITATION INSTRUMENT.—FRED. KLEE, Williamsburgh, N. Y.—This invention consists in the application to an irritation instrument of a regulating screw, whereby the points can be so adjusted as to penetrate the skin of the patient to a greater or less depth as may be desirable; and in the arrangement of a diaphragm of leather or other suitable material at the bottom end of the cylinder containing the pricks so that when said diaphragm is saturated with the liquid to be introduced in the skin, the whole operation is effected by causing the pricks to pass through the diaphragm just before they enter the skin of the patient.

COATING BRICKS.—FRANK JONES, Boston, Mass.—This is a process of coating evenly any necessary portion of bricks with mastic or cement so that it will be of a uniform thickness, thereby greatly lessening the tendency of the mastic to peel off after being exposed to the action of the atmosphere as when applied in the usual manner.

CLOTHES POLE.—F. W. TILTON, New Bedford, Mass.—This invention consists in constructing a clothes pole with a double-hooked end so that the line can be readily inserted between the hooks and withdrawn at pleasure, and when placed therein it will be firmly supported; and also in whatever direction the wind may blow, or how often it may change, the line will always be in a position in the double hooks, which will prevent it from becoming detached from the pole.

CLEANER FOR RING TRAVELERS.—WELCOME JENCKS, Manchester, N. H.—The object of this invention is to prevent the waste from lodging in the traveler and breaking the thread, as it will do if not removed during the operation of spinning.

SAFETY VALVE.—C. L. FRINK, Rockville, Conn.—This is an arrangement of a swinging supporter so combined with the stem and lever of a safety valve that the supporter will accommodate itself to the position of the lever, and the lateral strain on the valve stem will be diminished or avoided.

CIDER MILL.—S. J. HOMANS patentee, patent issued June 5th The inventor may be addressed at Newburgh, N. Y., not at Walden.

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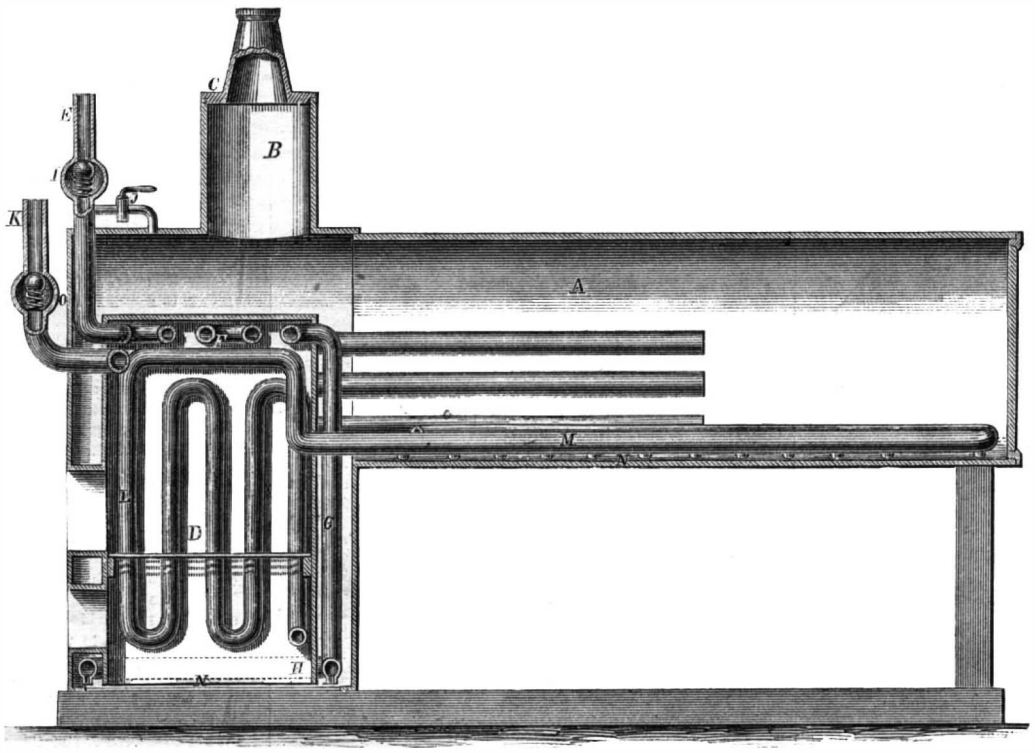
Improved Steam Boiler.

The increased and increasing cost of fuel, and the continual demand for it as a generator of steam power, has stimulated the inventive faculty to a remarkable degree to find means to reduce its consumption or to utilize a larger percentage of the caloric. The old-fashioned cylindrical boiler, having only a single or double flue to distribute the heat generated in the fire-box, is fast giving place to more complicated, scientific, and effective forms. The improvement under consideration is one among the many intended to economize the use of fuel and to make available a larger portion of the caloric generated by combustion. The illustration annexed represents a longitudinal vertical section of a boiler, A, similar in form to that of the locomotive. From the top rises the steam dome, B, provided with a cap, C, from which the steam is conducted to the engine. E is a pipe extending through the top or side of the boiler and communicating with a serpentine pipe, F, situated directly under the crown sheet of the fire-box D. From this serpentine pipe extends another, G, down in the space between the outside of the fire-box and the inside of the boiler. This is connected with the horizontal pipe, H, which is shown by the openings and dotted lines, and surrounds the bottom of the fire-box.



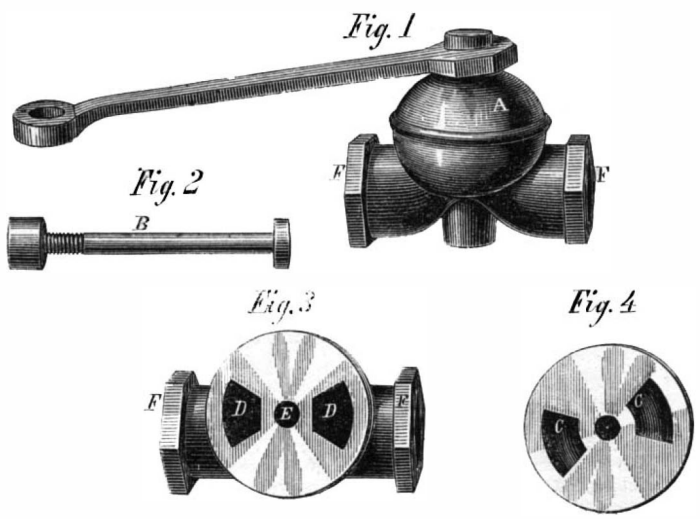
TANGER'S STEAM BOILER.

This pipe is provided with a set of nipples N, opening downward. Now, through the pipe, E, is forced gas or common atmospheric air, which, by traversing the serpentine pipe, is heated and discharges through the nipples, imparting additional heat to the water, and aiding in the circulation of the water and the disengaging of the steam. The air or gas is forced into the boiler by a pump or other similar device, and its return is checked by the valve, I. When the pump is not in operation the connection, J, is opened between the steam space and the pipe, E, to produce an equilibrium and allow the water to rise in the pipe to prevent burning. K is a similar pipe for a similar purpose, which enters the boiler from the front or side and connects with another serpentine-formed pipe, L, which surrounds three sides of the fire-box close to the sides. This also has a check valve, O, and connects with a return pipe, M, running along the bottom of the boiler and provided with downward opening nipples, N. Its operation and design are precisely similar to the first-described pipe. The object is to introduce to the water in the boiler highly-heated air or gas, which shall utilize the heat in the fire-box, aid in the circulation of the water, and thus indirectly in the production of steam, and directly by imparting additional heat.

Patent pending through the Scientific American Patent Agency by D. B. Tanger, whom address for further information, Bellefontaine, Ohio.

Allen's Improved Valve.

The accompanying engraving represents a disk or diaphragm valve, designed to supersede the common globe valve, which requires packing, and is difficult to keep in order after it is worn. Fig. 1 represents perspective view of the valve; Fig. 3 a face view of the valve seat, showing the ports, and Fig. 4 the valve face. The valve proper, A, forms the upper portion of the apparatus and is a cup-shaped casting of metal having an outer shell, and an inner shell surrounding the bolt, B, Fig. 2. The face of this hemisphere is finished smooth and has ports, C, opening into the annular chamber between the inner and outer shells, and corresponding with similar ports, D, in the seat, E. The pipes F, have free passages into this annular chamber by means of these ports. The upper and under portions of the valve are secured and held in close contact by the bolt, B, the head of which is on the top, and the nut underneath the valve. Between the nut and the bottom of the valve is a flat steel spring, having a tongue or spur fitting into a groove on the bolt, to allow the upper portion of the valve to turn without permitting the bolt to rotate. The spring holds the two faces of the valve together, while it permits a slight yielding to prevent unnecessary friction.



ALLEN'S DIAPHRAGM VALVE.

It is easy to see that the grinding and reseating of this valve could be easily accomplished in case of wear. It seems to be a very simple and efficient device for the purpose designed. Patented through the Scientific American Patent Agency, July 25, 1865, by D. D. Allen. All letters for information should be addressed to the Allen Valve Co., South Adams, Mass.

THE Patent Office Reports for 1863 are issued and in answer to numerous inquiries for them we would state that the reports can only be had through Members of Congress.

THE ADAPTATION OF IMPLEMENTS TO LABOR AND THE LABORER.

The continual improvements in labor-saving machinery, to which the attention of our inventors is directed, aims mainly at the release of the human body from immediate contact with the work to be performed, and the substitution of mechanical appliances for the direct power of muscle. The grand object is to contrive machines, which, managed by one or two men, will do the labor of dozens and hundreds. This is well, and we see on all hands the triumphs of genius in this substitution of the forces of steam, and the strength of metals for the powers of the human organism. But is there not another field of labor-saving invention, which, although by no means neglected, is yet imperfectly wrought? The improvement in the common implements of hand labor ought to keep pace with the inventions that replace the efforts of the laborer. Take a few familiar examples. Some blacksmiths persist in the use of a four-pound hammer for ordinary work, while another for the same work uses a much lighter one, producing as great an effect within the same time at a much less waste of muscular force. Carpenters sometimes select a hand-saw for the thickness of its plate and its width, rather than for its temper and perfect straightness. In the one case the workman moves back and forth a useless weight, and in the other the implement is as light as is possible for the result designed. The saw blade should be only thick enough to prevent "buckling," and should be set so as to cut a "kerf" only wide enough to allow its free movement.

We might cite many illustrations of the waste of human power by the use of unadapted implements. We copy the following judicious remarks on this subject from the *New England Farmer*. Speaking of the common hoe, it says:—

"To be the most efficient, the handle of this tool should be just long enough to enable the holder to stand as erect as possible, and at the same time apply sufficient power to effect his purpose. It should be strong enough to resist the force applied to strike the hoe into the ground, and not have any thing added to its bulk beyond that. The blade should be steel, thin, light, polished, and kept so by the workman, and should not have the tenth of an ounce in weight more than is necessary to give it the strength to perform the work required of it. Such a hoe should weigh two pounds, and no more, as the labor required to lift any more would be entirely thrown away. By observing the number of strokes struck by a man in hoeing during a day of ten hours, it will be found that he will lose a force each day equal to raising a tun-and-a-half weight several feet from the ground, if his hoe weighs one ounce too much. The labor required to raise such a weight, if multiplied by the number of days devoted to hoeing, would probably be found sufficient to hoe one or two acres of corn."

THE Omaha *Republican* of June 7th gives cheering bulletins of the progress on the Union Pacific Railroad. There are on the levee at that place fifty miles of iron, and ties for seventy miles, with 60,000 ties up the river, in the transportation of which five steamers are constantly employed. From one to two miles are finished daily, and at the above date the track had reached eight miles beyond Columbus

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THE

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

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☞ "The American News Company," Agents, 121 Nassau street, New York.

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VOL. XV., No. 1, [NEW SERIES.] *Twenty-first Year.*

NEW YORK, SATURDAY, JUNE 30, 1866.

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THE CULTURE AND MANUFACTURE OF SILK.

The war has done more than to unsettle and change the state of political parties. It has affected seriously the raising and manufacture of our great staple, cotton. The days of large plantations and aggregated settlements of farm laborers is past. Cotton will still continue to be an important staple of home manufacture and foreign export, but never again shall we see a whole section of country, comprising entire States, devoted almost exclusively to its cultivation.

For the benefit of the South—for the advantage of the country at large, and through the country, for the advancement of the world—we are not sorry. There is a meaning in all this, a meaning not altogether comprehended by our political leaders and statesmen. We believe that a subdivision of labor and pursuits not only insures the best results in itself, but produces the best effects on the world at large. There are exceptional cases where a particular locality is better adapted to the production of a particular material or its manufacture than to anything else, but those instances are only exceptional. There is hardly any fertile region but will produce equally well the raw material for several important manufactures, and, in many cases, will afford equal facilities for its manufacture.

Such, we believe, to be the South. The Gulf States appear to be the home of cotton. Some of the Atlantic States have endeavored to rival their sister States in its production, and, in some instances, with flattering results. But while the people have been engrossed with the production of the raw staple they have neglected its manufacture, purchasing, from those whose ingenuity has turned the product of their plantations into useful fabrics, the crops of their acres at a largely advanced cost. The manufacture of cotton at the South will undoubtedly hereafter become an important part of Southern wealth and importance.

But the business of silk raising and manufacture which, as early as the times of James I., was introduced into Virginia, ought to engage the attention of practical men. Owing to the demand for Virginia tobacco, it did not flourish, the planters preferring to cultivate the Indian weed to the production of the web of the Chinese worm. In 1732, artisans and others skilled in the silk business, were sent to Georgia, and succeeded in producing as fine a quality of silk as could be made in Italy, which commanded the highest prices in London. Before the close of the 18th century the last lot of Georgia silk was exported, owing to the revolutionary war and the want of interest in the business. About the middle of the century, or in 1747, its cultivation was undertaken in Connecticut, and some excellent qualities of silk, raw and manufactured, were produced.

For some reason, however, the silk business has never been a favorite one in this country. One reason has been undoubtedly the necessity of careful attention to the worms and the treatment of the cocoons, with the necessity of skilled labor in the manufacture of the raw material. It is, however, now becoming an important business. In Hartford and Manchester, Conn., the Cheney Brothers have the most important silk establishments in the country. They manufacture ribbons and dress silks, in no way inferior to those imported, and often far superior. But all their material comes from China, Japan, or southern Europe. In Hartford, also, is the establishment of Tobias Kohn, a Hungarian, who furnishes the New York market with the best specimens of silk braids and trimmings. But all the raw material for these manufactories are drawn from the other hemisphere.

The southern portion of this country is especially adapted to the culture of the mulberry and the raising of the silk worm. There is no adequate reason why it should not furnish all the material necessary to keep our home manufactories running and encourage the erection of others. At the North, also, it has been proved that silk can be successfully cultivated. We believe this could be made an important branch of our manufactures and a large item in our material wealth.

THE VALUE OF TIMBER.

We have already spoken of the attempts made to substitute some other material for fuel in place of mineral coal. Although, according to English statisticians, the limit of the production of coal in Britain can be approximately determined, and their calculations have engaged the attention of Government, this country leads off in the first successful attempt to provide for the possible contingency of an exhaustion of the coal beds, or, rather, here, to meet the demand for cheap fuel. Our coal mines will last us for an indefinite period, but owing to local or temporary causes, it has become an object to find a rival to the black diamonds which underlie our soil.

But while the attention of our people is drawn to the necessity of introducing a cheaper material than coal, as a fuel, our forests are rapidly wasting away. In localities not possessing good facilities for transportation, the trees in the forests are ruthlessly sacrificed, and, if the waste continues in the same ratio for the next half-century as it has for fifty years past, there must be portions of our country which will be changed from fertile farms to barren wastes. This is no fancy or sensational statement. The grand reservoirs of our springs, brooks, and rivers are our forests, except on the slopes of mountain ranges. They conserve the moisture deposited by rain and dew, by frost and snow, and deal it out through the arid and thirsty months, giving fertility and verdure to land that otherwise would not feed a goat. Forests serve a grand object in the economy of nature. They should be valued and protected. For this utilitarian reason, as well as for others of a more æsthetic character, we desire to see our forests preserved.

A trial lately made on the New Haven, Hartford, and Springfield Railroad, established, so far as a single trial could, the value of peat as a fuel above that of coal. The report of the run of twenty-six miles and return, demonstrated the fact that peat gave a greater heat, weight for weight, than the best coal, either bituminous or anthracite, at a cost of not more than sixteen per cent of that of coal. Here, then, is at least a partial substitute for coal as a fuel, and we do not despair yet of the economical use of petroleum for that purpose. The gas from wells has been used economically and with excellent results in places where wells have been bored which yield gas rather than oil. Of course this material must, from its nature, be restricted in its application. But all these help to preserve our woods from the waste of burning.

The alarming inroads made of late years upon our forests, the continually exacting demands for lumber, and its adaptation for thousands of purposes, make wood an absolute necessity. Yet although a very large portion of our territorial area, less than a hundred years ago, was covered by forests, it is a fact that large bodies of timber are now the exception rather than the rule. The forests of Maine, deemed at one time inexhaustible, the woody regions of Pennsylvania and Western New York, and even the forests of Canada, are yearly decreasing in extent. The pine is found now in larger quantities in the lower peninsula of Michigan than anywhere on this northern continent. How long can it remain? This is a question for those who have calculated on the forests of Maine as inexhaustible.

To be sure, the prairie dwellers of the West, with a foresight and enterprise that does them infinite credit, have gone to planting trees; but the object is a temporary and present one. The nature of the growth is rapid, attaining quick maturity, and intended only to subserve a present interest. No permanent forests will arise on our prairies. The wood will be cut as fast as it grows. Under these circumstances the discovery of a material which will fulfill the purposes of fuel as readily and cheaply as coal or wood, and the cessation of the wasteful destruction of timber by burning, in order to remove it from the soil, has become a necessity. We look to the inventive talent of the country—never yet appealed to in vain—to save to us and coming generations, those great storehouses of moisture—those equalizers of contingencies of the seasons—and depots for manufacturing material, our forests.

PARIS UNIVERSAL EXHIBITION.

A bill has passed the Senate—which will no doubt become a law—appropriating $48,000 in coin to provide the furniture and fixtures for the proper exhibition of articles sent to the Paris Exhibition from this country. The sum of $2,000 a year is appropriated to pay the principal agent. The sum of $33,700 is appropriated for office rent in New York, freights on articles to France, and other contingent expenses; and a further sum of $35,703 for railway transportation from Havre to Paris and returning, storage, clerk hire, etc. And, in addition to the above sums, $10,000 are appropriated to pay the traveling expenses of ten professional and scientific Commissioners—to be appointed by the President—and ten additional Commissioners are to be appointed, who are to pay their own expenses. The total appropriation amounts to $129,403, which include $48,000 in coin.

Senator Grimes offered an amendment, that no money be paid under the resolution until the French Government gave ample assurance of the withdrawal of French troops from Mexico, and urged that the whole exposition was got up on purpose to glorify the infant Napoleon, now ten years of age, who had been made President of the Exposition. This proposition was gravely debated at considerable length, but did not find much favor.

We hope the French troops will be speedily withdrawn from Mexico, and that hereafter the Emperor Napoleon will mind his own business; but it would be unworthy a great Government like ours to exhibit such a spirit in reference to an exhibition of industry, which so many of our countrymen regard with deep interest.

PATENTS IN CONGRESS AGAIN.

The House has had under consideration a bill authorizing the Commissioner of Patents to determine and decide an application of Jonathan Ball for the extension of his patent "for an improved mode of coating the interior side of water pipes with hydraulic cement." This patent was duly extended seven years by the Commissioner, and having, under operation of law, run twenty-one years, expired some time last year. Mr. Dawes, of Massachusetts, opposed the bill chiefly on the ground that it was against public policy for Congress to legislate to extend expired patents. He insisted with great justice that, after the patent had been opened to the public, by operation of law, for any one to enter fully upon its manufacture, it was not right for Congress to undertake to revive the right. The position taken by Mr. Dawes is impregnable and, we are happy to say, resulted in the defeat of the bill. Such legislation, if insisted upon, would soon make our whole patent system odious. We therefore, speaking in the interest of the great body of inventors and patentees, protest against all attempts to revive dead patents.

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ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING JU E 17, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

55,595.—EAVES-TROUGH.—J. P. Abbott, Cleveland, Ohio:

I claim the adjustable arm, A, notched standard, B, slotted lips, C, D, and key, F, in combination with the cross-tree, E, strap, G, and gutter, H, as an I for the purpose set forth.

55,596.—HEATING AND SOLDERING GUN-BARRELS.—Ethan Allen, Worcester, Mass.:

I claim, 1st, The mechanism, substantially as described, for heating and soldering gun-barrels by blowing the heating blast through them.

2d, The clamps, J, composed of set-screws and springs, substantially as described, for holding gun-barrels while being soldered.

55,597.—BOLT-HEADING MACHINE.—Henry E. Anthony, Providence, R. I.:

I claim, 1st, The combination of a swivel-punch, F, with the die or collar which confines the bolt at a point above the heading chamber, substantially as described.

2d, Removing the thimble, R, and pin, T, or any other equivalent device which may be used to support or confine the lower end of the bolt, after such bolt has been partially headed, in order to allow any surplus stock to be forced from the upper chamber down through the head of the bolt, substantially as described.

3d, The sliding die-holder, G, operating substantially in the manner described.

4th, The combination of screw, E, and swivel-punch, F, operating substantially as described.

5th, I also claim the manner of securing the hand-tool by the cap, n, substantially as described.

55,598.—MODE OF COVERING STEAM BOILERS.—John Ashcroft, New York City:

I claim covering a steam boiler pipe, or other heater, with felt or other non-conducting material, when the latter is supported on a frame-work removed from and surrounding the former, not being in direct contact, but having an air-space intervening between said felt and boiler pipe, or other heater, constructed and operated substantially in the manner described and for the purpose set forth

55,599.—SPOKE-SHAVE.—Leonard Bailey, Boston, Mass.:

I claim the combination of the screws, f, f, and nuts, g, g, or their equivalents, with the clamp-bar, c, and with the stock divided lengthwise into two parts or portions, constructed substantially in manner and so as to operate as described.

I also claim the arrangement of the clamp-bar, c, with the screws, f, f, and nuts, g, g, and with the stock divided lengthwise into two parts or portions, constructed substantially in manner and so as to operate with the said screws and nuts, substantially as set forth.

I also claim the combination and arrangement of the shoulders i, i, with the screws, f, f, the clamp-bar, c, the cutter, d, and bed, b, or the stock, substantially as set forth.

55,600.—MANUFACTURE OF CARBONATE OF SODA.—Haydn M Baker, Rochester, N. Y.:

I claim the application of the combined processes as herein described for the formation of carbonate and bicarbonate of soda, muriatic acid, and caustic lime, using for the said purposes the aforesaid carbonate of lime, carbonate of magnesia, and chloride of sodium, in the manner herein set forth, or any other processes substantially the same and which will produce the same intended effects.

I also claim the construction and application of the boiler and lime-retort in combination, as herein described and represented by the accompanying drawings, for the purposes duly set forth.

I also claim the application of heat and pressure without limitation in the process of forming bicarbonate of magnesia and subsequent double decomposition of chloride of sodium and bicarbonate of magnesia, forming chloride of magnesia and bicarbonate of soda.

55,601.—HOT-AIR ENGINE.—Cyrus W. Baldwin, Boston, Mass.:

I claim a vessel or reservoir placed between the furnace and the working cylinder into which jets of water are introduced at certain intervals and in regulated quantities, for the purpose specified.

I also claim the combination of the vaporizing trough, or its equivalent, with the hot-air duct, essentially as above set forth.

I also claim the peculiar construction of the trough, a, as made pyramidal or pointed at one or both its ends, and with the partitions, C, C, C, in manner and to operate as before set forth and explained.

55,602.—MACHINE FOR MAKING HORSE-SHOES.—Hazen J. Batchelder, Boston, Mass.:

I claim the mode of constructing each of the rolls, viz., not only with each of its dies made in sections and with lips to each, as described, but with rings to encompass the lips, the said sections and rings being held in place by a shoulder, l, and a channel, i, and clamps, N, N, or their equivalents, the whole being substantially as and for the purpose specified.

I also claim the separate creasing-die, O, made as described, in combination with two of the rings, H, H, and a sectional die, R, arranged between them, the whole being as set forth.

I also claim the combination of the lateral die, P, for obtaining variation of width of the blank with the two ring-dies, H, H, the dies, E, O, and R, and the mechanism for moving the roll-shaft, C, vertically, for the purpose of effecting the variations of thickness of the blank, as described.

55,603.—GRATE-BAR.—Horatio K. Bates, North La Crosse, Wis.

I claim the off-set or dropper grate-bar herein set forth and shown.

55,604.—ORNAMENTING WOOD.—Alexander Beckers, New York City:

I claim producing mosaics, etc., of different woods, etc., in the manner herein specified.

55,605.—CHAIR-SEAT.—Alanson Bingham, Surrey, N. H.:

I claim attaching a seat composed of a single thickness of strips of oak, ash, or other suitable wooden material to a frame by means of slits, or slits and grooves, substantially as described.

55,606.—SLIDE FOR EXTENSION TABLES.—J. F. Birchard, Milwaukee, Wis.:

I claim adding thereto or combining therewith the additional slide-bar for supporting the leaves of the table, substantially as herein set forth.

55,607.—COTTON CULTIVATOR.—W. W. Blair, Lebanon, Tenn.:

I claim, 1st, The arrangement of the adjustable revolving harrow, H, with the revolving and adjustable chopping knives, J, J, upon the shaft, I, substantially as and for the purpose herein specified.

2d, The scrapers, M, M, pivoted near their inner ends, as represented and adjusted by means of the rods, d, d, levers, e, e, and rack-bars, g, g, substantially as and for the purpose herein fully set forth.

3d, The arrangement of the adjustable scraper-feet, D, D, with the scrapers, M, M, and the cutters or colters, L, L, substantially as and for the purpose described.

55,608.—CORSET AND SKIRT SUPPORTER.—Erastus Blakeslee, Plymouth, Conn.:

I claim, 1st, The stay, C, when arranged upon the body of the corset, so as to secure and support the skirt, substantially as described.

2d, In combination with a corset, buttons constructed and arranged so as to be self-adjusting on the stay, C, as and for the purpose specified.

3d, A corset supporter, constructed substantially as described, and attached to the corset in the manner herein set forth.

55,609.—ORDNANCE.—L. W. Broadwell, New Orleans, La.:

I claim the exterior reinforce, B, with a depression on its interior periphery, corresponding to the enlargement on the gun, with shoulders, b, b', substantially as and for the purpose described.

55,610.—WASHING MACHINE.—H. Bucknall, Darien, Wis.:

I claim, 1st, The combination of the rubbing concave, B, hung loosely in the machine by journals or pivots, with the uprights, G, cam, H, and rubbing bar, C, substantially as shown and described.

2d, The cam, H, in combination with the uprights, G, G, and pin, q, when constructed and operating substantially as and for the purpose specified.

3d, The thumb-screw, f, for raising and lowering the rubbing-board, C, in combination with the rock-shaft, F, and rod, E, as shown and described.

4th, In a washing machine constructed substantially as described, I claim the employment of a joint, e, at the connection of the rod, E, and the cross-rod, d, substantially as and for the purpose specified.

55,611.—GAP BUCKET HOOK.—James Bullock, Readsboro', Vt.:

I claim the form of three hooks combined in one piece of wire in the circle.

55,612.—HOE AND CORN-PLANTER.—John A. Burchard, Beloit, Wis.:

I claim the rod, D, hoe, C, spring, E, and roller, B, in combination with the stirrer, I, gauge plate, K, and cylinder, A, as and for the purpose set forth.

55,613.—BREECH-LOADING FIRE-ARM.—John Burke, Syracuse, Ill.:

I claim, 1st, The combination of the tipping-barrel with the front part of the hinge and stock, and of the rear part of the stock and hinge with the breech-piece or plug, when the parts are arranged for joint operation, substantially as described.

2d, The jointed retractor, constructed substantially as described, to expel the cartridge by a positive motion.

3d, Moving the retractor in one direction by a cam, and closing it by grazing the breech, as described, whereby I draw in the retractor without using a spring, and am also able to prevent friction on the flange of the cartridge.

4th, The combination of the tipping-barrel, the steady-pin, I, the locking bolt, L, the cone-plug, L, the cone-plug, K, and the shoulder, K', substantially as described, to hold the barrel firmly while firing.

5th, Constructing the locking-bolt so that it shall slide in a groove partly in the lock and partly in the breech, as described, to prevent strain on the lock, as set forth.

55,614.—DEVICE FOR CUTTING GREEN CORN FROM THE COB.—Jonathan Burt and Leonard F. Dunn, Oneida, N. Y.:

We claim, 1st, The sliding-frame, D, in connection with the springs, F, cutters, e', scrapers, h, any or all of them, and the tube, C, or its equivalent, all arranged to operate in the manner substantially as and for the purpose set forth.

We further claim the oblique rods, b, of the frame, D, connected with the plates or springs, d', for the purpose of expanding the cutters, e', and springs, f', substantially as and for the purpose specified.

55,615.—STEAM PLUG VALVE.—Russel Burton, South Adams, Mass.:

I claim, 1st, The arrangement in connection with the pipe, A, of the conical enlargement, B, conical plug, E, spring, H, and screw-cover, D, when the parts are constructed and combined as described and represented.

2d, The combination of the reservoir, J, one or more, with the conical plug, E, substantially as described and for the purpose set forth.

55,616.—LOCK.—Ira D. Bush, Detroit, Mich.:

I claim, 1st, The sliding and swinging tumblers, G, hung upon the bolt of the lock, and arranged and operating substantially in the manner and for the purpose specified.

2d, The collar, R, of the knob, spindle, or shaft, Q, in combination with the opening, S, T, in the lock-plate, the yoke, U, placed over such shaft and interlocking with the said collar, substantially as and for the purpose described.

55,617.—MACHINE FOR SHARPENING HORSE-SHOE CALKS.—Ensign A. Bushnell, Dodge county, Wis.:

I claim the arrangement of all the parts as herein set forth, as and for the purpose described.

55,618.—LIFTING-BAR.—D. P. Butler, Boston, Mass.:

I claim, 1st, The construction of the lifting-bar with the surfaces, c, in line with the center of the bar, a, substantially as set forth.

2d, The socket or socket-piece on the bar, and the pivot on the ring, substantially as shown.

3d, The elastic cushion placed between the ring and bar

4th, The construction of the bar with the sockets or socket pieces on opposite surfaces thereof, substantially as and for the purpose set forth.

5th, Making the ring detachable from the weight-rod, substantially as set forth.

6th, Combining with the ring the spring, i, by which the ring and bar are held together, substantially as described.

55,619.—MACHINE FOR PRESSING CIGARS.—Jeremiah Campbell, Lancaster, Pa.:

I claim a press provided with a vertical screw, I, and horizontal or side screws, H, H, when the top and bottom cross-pieces, C, D, are provided with grooves, d, on one end in combination with a vertical press-board, E, arranged, constructed, and operating in the manner and for the purpose specified.

I also claim the loose slats, J, provided with blocks, K, on one or both sides at the ends, and when of double or triple length, intermediate blocks, all half the thickness desired to form the chamber, when employed in the manner and for the purpose set forth.

I also claim the partition boards, G, L, with the extended arms and followers, F, in combination with the vertical press-board, E, constructed and operating in the manner and for the purpose specified.

55,620.—SPRING LANCE.—George J. Capewell, West Cheshire, Conn.

I claim the slotted cap-piece, K, for the casing, A, having outward bent lips or flanges, h, upon each side of its slot or opening, substantially as and for the purpose described

55,621.—MILK-PAIL.—J Carton and Wm. Ralph, Utica, N. Y

We claim as an article of manufacture a wooden milk-pail with a tin lining, constructed as described.

55,622.—ATMOSPHERIC CHURN-DASHER.—S. Case and A. W. Pratt, Pultneyville, N Y:

We claim the combination of the adjustable and removable valve, D, with the rod, A, and tube, G, substantially as and for the purpose described, the rod being provided with the bulb, B, having the seat, a, for the reception of different-sized wings, as set forth.

55,623.—PRUNING INSTRUMENT.—Richard Collier, Springfield, Ohio.

I claim a pruning tool the blade of which is sharpened upon the chisel-formed point and also upon both the edges, the same being attached to a handle, substantially as set forth

55,624.—PORTABLE DOOR-FASTENING.—Dennis Conlon, Portland, Maine.

I claim the combination of the plate, B, having the spurs, b, and shoulders, s, with the pivot, n, and button, A, constructed as described all as and for the purposes set forth

55,625.—EGG-BEATER.—Moses G Crane, Boston, Mass.

I claim the combination of the segment gears and pinions with the spindle, beating-wires, and standard, when said segment gears are constructed and arranged to rotate horizontally, substantially as set forth.

I also claim, in combination with the standard, b, spindle, a, and wires, c, arranged and operating as described, the plate, G, with its fingers, r, arranged to hold the standard, b, substantially as described.

55,626.—PUMP FOR DEEP WELLS.—Joseph H. Davis, Alleghany City, Pa.:

I claim the enlargement, B, of the valve-chamber, A, when constructed and operating for the removal of the foot-valve, F, substantially as herein described and for the purposes set forth.

55,627.—SOUNDER MAGNET.—Samuel F. Day, Ballston, N. Y.:

I claim, 1st, The combination of the posts, d, d, with the raised plate or bridge, C, in the manner and for the purpose set forth.

2d, The combination of the metallic frame, A, sounding-board or insulator, B, and metallic bridge or arched plate, C, for the purpose set forth

55,628.—FERRY-BRIDGE GATE.—Lewis P. Decker, Brooklyn, N. Y.:

I claim, 1st, The combination of the gates, C and D, constructed and arranged as herein described, with the shafts, E and F, and with the bridge arches or other suitable supports, substantially as described and for the purpose set forth.

2d, The combination of the ratchet-bar, I, with the gear-wheels, G and H, and with the shaft, E and F, substantially as described and for the purpose set forth

55,629.—MAKING SIRUP FROM CORN.—H. J. Delsuer, Waukesha, Wis.:

I claim the within-described process of making sirup from corn, by following the various manipulations which are specified.

55,630.—SHOVEL PLOW.—Paul Dennis, Schuylerville, N. Y.:

I claim, 1st, Sharpening or providing the wings, D, D, with double cutting edges, as and for the purpose described

2d, The wings, D, D, constructed in such a manner as to be capable of being reversed in position, so as to throw the earth outward to a greater or less distance, and also to be capable of being expanded or contracted, as occasion may require, as and for the purpose set forth.

55,631.—FRUIT BOX.—T. B. Doolittle, Ansonia, Conn..

I claim a fruit box formed of two end pieces, in combination with a single piece bent around said blocks or end pieces, and overlapped, the whole constructed and arranged substantially as set forth.

55,632.—TABLE FORK.—John Edmond and William H. Wirt, Washington, D. C.:

We claim providing a table fork with a file edge or surface, substantially as specified, for the purpose of sharpening a knife.

55,633.—AUTOMATIC GATE.—J. G. Elkins and J T. Green, Marquette, Wis.:

We claim, 1st, The method of hanging the gate to the bars, F, F, by which they are kept in contact by positive force while closed, without the use of latches or catches of any kind, substantially as shown and described.

2d, The combination of the timbers, H, H, levers, I, I, and links, J, J, rods, l, l, bell-cranks, K, K, and links, M, M, all arranged and operating substantially as shown and described.

55,634.—WASHING MACHINE.—John C. Fellows, South Adams, Mass.:

I claim, 1st, The combination of the vibrating frame, E, with the frame, B, the slots of frame, E, rising between the slots of frame, B, substantially as described.

2d, The vibrating roller whose frame has vertical motion, as described, with the fixed and vibrating frames, B and E, substantially as described

55,635.—FISHING NET.—Edward A. Field, Sidney, Maine:

I claim the improved manufacture of fishing net or apparatus made substantially as described, with the sinker, the ground-guard, and the mouth-hoop, the lip hoops, or the same and the bait-line and float, all combined together and with netting, and so as to operate substantially as specified.

55,636.—POSTAL LETTER-BOX.—D. D. Foley, Washington, D C.:

I claim a postal letter-box having an ante-chamber in which packages are deposited, when said ante-chamber has a sliding bottom, which is withdrawn when the entrance-port is closed, and *vice versa*, said sliding bottom being connected to and operated by the valve which covers the entrance-port by a lever or tilting-bar, and so adjusted that entrance to the receptacle below the ante-chamber will always be barred either by the valve over the entrance-port or by the sliding bottom, substantially as described.

55,637.—BOOT AND SHOE STRETCHER.—William Frederick, Ashland, Pa.:

I claim, 1st, An improved boot and shoe stretcher formed in two parts, A and D, hinged together at their forward ends by a treble-jointed hinge, E, substantially as described and for the purpose set forth.

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2d, The combination of the rod, J, pinion-wheel, I, rack B and roller or rollers, C, with each other and with the parts, A and D, of the last, substantially as described and for the purpose set forth.

55,638.—GAUGE FOR BOILERS.—C. L. Frink, Rockville, Conn.:

I claim the arrangements of the cocks, C, D, in combination with the socket, B, and tube, A, and operating in the manner and for the purpose herein specified.

55,639.—SAFETY VALVE FOR BOILERS.—C. L. Frink, Rockville, Conn.:

I claim, 1st, The hinged supporter, D, in combination with the valve-stem, C, and lever, F, of a safety valve, substantially as and for the purpose described.

2d, The central screw, f, and clamping-plate, e, in combination with the packing-piece, d, and valve, B, constructed and operating substantially as and for the purpose described.

55,640.—GAUGE COCK.—C. L. Frink, Rockville, Conn.:

I claim the flexible and elastic valve, D, with a central passage, c, in combination with the conical seat, E, spindle, C, adjustable gate, G, and body, A, of a gauge cock, constructed and operating substantially as and for the purpose set forth.

55,641.—LIGHTING GAS BY ELECTRICITY.—Samuel Gardiner, Jr., New York City:

I claim, 1st, The combination with a gas-burner of an electrical conducting cord and tassel, D, D′, connected with the poles of a battery, substantially as described.

2d, The combination with the above, of the stiff wire, G, igniting-finger, J, lever, L, and spring, M, substantially as described.

3d, In combination with the electrical lighting devices herein described, I claim the non-conducting or insulating stud, R, employed in the manner described.

55,642.—TURNING GAS-COCKS BY ELECTRO-MAGNETISM.—Samuel Gardiner, Jr., New York City:

I claim, 1st, Turning a gas-cock by means of a sliding-rod, E, and click, G, acting directly upon the toothed-wheel, H, on the axis of said gas-cock and employed in combination with an armature, B, and magnet, A, A, substantially as described.

2d, The combination with the armature, B, of the guides, C, C, and springs, K, substantially as and for the objects specified.

3d, The stop or stud, c, attached to the sliding-rod, E, and employed to limit the motion of the wheel, H, as set forth.

4th, The combination with the wheel, H and E, and click, G, of the retaining spring, J, applied and operating in the manner and for the purpose substantially as described.

5th, In combination with the apparatus herein described, I claim the helical spring, D, adjustable collar, M, and thumb-screw, N, arranged as described and employed for the purpose specified.

55,643.—BUTT FOR BLINDS.—O. S. Garretson, Buffalo, N. Y.:

I claim, 1st, The loose pin, C, provided with the cam, c, and notch, f, in combination with the wings, A, B, provided respectively with the flange, f, and stop, g, arranged and operating substantially in the manner and for the purpose set forth.

2d, In combination with the loose pin, C, I claim the conical seat and corresponding bearing of the parts, A, B, or their equivalents, arranged and operating as shown and described.

3d, The free axial pin or bolt, C, operated by its own weight, in connection with suitable stops on the wings of the butt for forming a self-fastening hinge, substantially as set forth.

55,644.—SHUTTER HINGE.—O. S. Garretson, Buffalo, N. Y.:

I claim the locking-bar, H, in combination with the parts, B and D, of a hinge, constructed and operating substantially as shown and described.

I also claim forming the wings, B, B, with concave faces in combination with the pendant bar, H, when said bar moves on a plane with the wings, substantially as and for the purposes set forth.

55,645.—ARTIFICIAL LEG.—David Gilson, Nashua, N. H.:

I claim an adjustable socket or pad supported upon springs or their equivalent, for the purposes as herein set forth; I do not limit my claim to the particular form as herein shown, but extend it to any other substantially the same.

55,646.—BOLT-HEADING MACHINE.—A. B. Glover, Derby, Conn.:

I claim, 1st, The two pairs of levers, Y, Y, Y′, Y′, with the forming dies, X, X, X′, X′, arranged so that one pair will operate at right angles to the other pair, in combination with the two heading dies, O, O*, all arranged to operate in the manner substantially as and for the purpose set forth.

2d, The attaching of the heading dies, O, O*, to a transverse or laterally moving slide, I, fitted to the vertically moving slide, H, and operated through the medium of the arm, J, rock-shaft, K, arm, L, and the cam, M, or their equivalents, for the purpose of bringing the dies, O, O*, over the bolt-rod at the proper time, substantially as shown and described.

3d, The holding dies, S, S*, in combination with the lever, V, operated by the notched wheel, W, for the purpose of holding the bolt-rod during the heading operation, and releasing the same after said operation is performed, constructed and arranged substantially as described.

4th, The lever, B*, in combination with the pawl, v, in the driving shaft notches, u, in the driving pulley, A2, rod, D*, spring, d*, and cam, E*, all arranged substantially as shown to automatically stop the machine at the completion of the heading of the bolt, substantially as shown and described.

55,647.—HANGING MIRROR.—J. S. and H. F. Gray, Chelsea, Mass.:

We claim the friction plates, d, f, having irregular contact surfaces, constructed and operating together as and for the purpose substantially as set forth.

55,648.—SNAP HOOK.—Adam Hagny, Keokuk, Iowa:

I claim a snap hook, a, having an eye, b, in its shank, through which passes the spring, B, which is attached by projections, c, c, on the side, and the projection, c, at the end, which holds the said spring by being flattened down upon it, constructed and arranged as described.

55,649.—CHEESE VAT.—L. C. Hains, Bedford, Ohio:

I claim, 1st, The detachable hinges, E, in combination with the pan, C, and vat, B, when arranged as and for the purpose set forth.

3d, The brace-rib, J, pins, n, in combination with the pan, C, and vat, arranged as and for the purpose set forth.

55,650.—RAILWAY CHAIR.—Alexander Hamill, Baltimore, Md.:

I claim the construction of the chair with its hinge, L, at the outside end, when arranged and fastened to the cross-tie, B, by a bolt, F, with a flat bar head, G, below, and a forked key, H, above, substantially as herein described and for the purposes set forth.

55,651.—SKIRT-SUPPORTER.—Prescott V. Harrington, Attleborough, Mass.:

I claim a skirt-supporter consisting of a loop and pin tongue and catch combined, the article being substantially as specified.

55,652.—GAS STOVE FOR HEATING.—David Greene Haskins, Cambridge, Mass.:

I claim, 1st, The combination of the air-heating chamber, B, with the chamber, D, the concentric casing, a, and interposed radiating material, substantially as and for the purpose specified.

2d, The combination of the tapering chamber, G, with the chamber, D, substantially as and for the purpose specified.

3d, The combination of the air-heating chamber, B, the escape pipe, o, and the partitioned mantel or radiating chamber, F, as and for the purpose set forth.

4th, The arrangement of the upper burners, g, with the chamber, D, in combination with the chamber, B, and space, H, as and for the purpose specified.

55,653.—FISHING REEL.—Anson Hatch, New Haven, Conn.:

I claim the skeleton spool in combination with the band, A, A, when the whole is constructed, arranged, and fitted for use, substantially as herein described.

55,654.—MOWING MACHINE.—Eleazer and David Hinckley, Worcester, Mass.:

We claim the combination and arrangement of the cam-wheel, F, rocker lever, E, connecting-rod, D, the shaft, G, and its beveled pinion, H, and annulus, I, with the driving wheel, K, and the knife, C, the said rocker-lever being provided with friction rollers or projections for the cam-wheel to operate against, and the whole being substantially as specified, and for the purpose of operating the knife, C, by the revolution of the wheel, K.

55,655.—REFRIGERATOR.—Aaron A. Hinkley, Boston, Mass.

I claim the combination and arrangement of the chamber, d, and air-passage, e, of the cover, with the passages, f, f, and the ice-box or pan, C, arranged in the case, A, substantially as specified.

I also claim the combination and arrangement of the cold-water coiled pipe, D, and its discharging branches, with the case, A, and the ice-pan, the chambered cover and its air-passage, and the air-passages leading therefrom, the whole being substantially as described.

55,656.—BENCH VISE.—John S. Hoar, West Acton, Mass.:

I claim as a special improvement in bench vises, of the kind described or those to turn horizontally on a bed-plate, the combination of the long curved back slot, d, and its screw, f, and two side curved slots, e, e, and their set-screws in the stationary jaw-carrier, C, and with the jaws, C, D, all constructed and arranged to operate together substantially as specified.

55,657.—POTATO-PLANTER.—Lyman J. Holcomb, Nunda, Ill.:

I claim, 1st, The combination of the pole, E, frame, F, seat, G, hopper, H, tube, I, beam, M, and plow, L, arranged and operating as and for the purposes specified.

2d, In combination with the above and the wheels, A, and axle, B, of a wagon, the circular plate, R, pins, a, bell, S, lever, T, and spring, d, arranged and operating substantially as and for the purposes set forth.

55,658.—MACHINE FOR PRESSING AND MOLDING PLIABLE MATERIALS.—George C. Howard, Philadelphia, Pa.:

I claim, 1st, The form of the housings, A, A, combining all the necessary bearings in one piece with the table, B, constructed substantially as described.

2d, Providing the treadle and housings with two or more fulcrum bosses, substantially as and for the purpose specified.

3d, The slots in the stand, P, at right angles to those immediately under it in the table, R, substantially as and for the purpose described.

55,659.—WINDOW-SASH SUPPORTER.—H. C. Hunt, Amboy, Ill.:

I claim, 1st, The case, A, with its double inclines, b, b″, and its corresponding slot, c, all operating as and for the purpose shown.

2d, The anchor, C, with its double inclines, f, f″, and its knob or finger-piece, r, operating as and for the purpose shown.

3d, The friction-roller, E, operating as and for the purpose shown.

55,660.—GANG PLOW.—James B. Hunter, Ashley, Ill.:

I claim, 1st, The bolster, G, screws, H, H, I, and plow-beams, J, J, when used in combination with the rods, K, L, and all arranged substantially as and for the purpose set forth.

2d, The attaching of the plow-beams, J, J, to the bolster, G, through the medium of the rods, K, placed at the under sides of the beams, J, and fitted loosely at their front ends on a rod, L, at the rear of the bolster, substantially as and for the purpose specified.

3d, The raising of the plows, P, out of the ground by means of a rod, M, crank-shaft, N, and lever, O, all arranged substantially in the manner as and for the purpose set forth.

4th, The adjusting of the shares or points of the plows in a greater or less inclination downward, by means of the screw-rods, n, connected to the upper parts of the standards, Q, substantially as shown as described.

55,661.—CUTTER FOR DOVETAILING MACHINES.—John C. Hursell, Boston, Mass.:

I claim the construction of the cutters, as herein described, for polishing and condensing the surfaces of dovetail tenons or mortises.

Also providing the upper outer corners of a cutter, constructed as above claimed, with outward cutting lips, as and for the purpose specified.

Also constructing the conical cutter-head, a, with a slot to receive a solid cutter with opposite cutting edges, the cutter being inserted in said slot and confined to the head, as described.

55,662.—CLEANER FOR RING-TRAVELER SPINNING MACHINES.—Welcome Jenckes, Manchester, N. H.:

I claim an adjustable cleaner for ring-travelers, made substantially as above described.

55,663.—RAILWAY CAR FOR PREVENTING ACCIDENTS.—F. W. Jenkins, Brooklyn, N. Y.:

I claim a roller or rollers hung in a vertical plane in front of the wheels of a railway car, and so as to turn thereon, substantially as and for the purpose described.

I also claim so hanging the roller, C, to railway cars, that it can have a play in a vertical direction, substantially as described and for the purposes specified.

55,664.—MACHINE FOR FACING BOOT AND SHOE BOTTOMS.—N. B. Jewett and E. Everson, Haverhill, Mass.:

We claim, when combined and arranged as described and so as to operate in the manner and for the purpose specified, the shaft, d, grinding cylinder, b (these being parallel with each other, and operated from wheel, h, by one belt, g), the cases, c and e, and the angular fan blades, f.

55,665.—CASTER FOR FURNITURE.—William Johnson, Milwaukee, Wis.:

I claim, 1st, The combination of the rose-plate, D, in one or more parts, the chamber, h, and the collar, G, for the purpose described.

2d, The shoulder, i, in combination with the rose-plate, D, thimble, l, collar, G, and chamber, h, substantially as shown and described and for the purpose set forth.

55,666.—SPINNING TOP.—Edward E. Jones and G. L. Kitson, Philadelphia, Pa.:

We claim the holes, A, A, with the hole, C, in the center of the top, in combination with a musical attachment, for the purpose herein described, an æolian or musical top.

55,667.—MANUFACTURE OF BRICKS.—Frank Jones, Boston, Mass.:

I claim, 1st, The process substantially as above described of applying to bricks a preparation of mastic or cement.

2d, The apparatus constructed and operating substantially as above described for applying mastic to bricks separately before being laid.

3d, As an improved article of manufacture, I claim a mastic-covered brick prepared substantially as above described.

55,668.—CORN PLANTER.—Wm. H. Karicofe, Harrisonburg, Va.:

I claim the combination of the several parts above described, in the construction of a machine that will furrow two rows and drop therein at regular intervals corn and ashes or similar fertilizer, and will cover the same, removing clods and small stones, that by means of the adjustable screws in the cups the amount of corn or of the fertilizer may be fixed by the operator, that by means of the cross-bars on the right wheel the land will have the appearance of being checked, and by means of the driver the machine may be thrown out of gear and removed to any part of the field without the shaft turning.

55,669.—SPARK-ARRESTER.—Charles Bright Keyes, Washington, D. C.:

I claim, 1st, The revolving cover, d, d, constructed substantially as described in paragraph 2d, letters d, d and i, i.

2d, The combination of the revolving cover, d, d, with a shield or deflector, e, e, and an opened-mouthed trumpeter, g, g, substantially as described in paragraph 2d, letters g, g.

3d, The combination of the revolving cover, d, d, and the shield or deflectors, e, e, and the open-mouthed trumpeter, g, g, the opening through, f, f, in connection with a pipe, b, b, and the water-tank, c, c, and the arrangement, i, i, for turning the cover, d, d, substantially as described in paragraphs 3 and 4.

55,670.—CAR BRAKE.—Washington H. Kilburn, Kennedy, N. Y.:

I claim, 1st, Bringing the brakes of a railroad train to bear against the wheels of the several cars, by the momentum and weight of the train itself, when the engine drawing such train or any car of its series of cars, is arrested in its motion in any possible manner, substantially as herein described and for the purpose specified.

2d, The draw-head, E, bar, F, and lever, G, when combined and arranged with regard to and connection with the brakes of a railroad car, substantially as described and so as to operate as and for the purpose specified.

55,671.—BOOT AND SHOE.—John Kimball, Boston, Mass.:

I claim the improved manufacture or shoe as made with a layer of cork, so arranged between its inner and outer soles that the leather of the outer sole may come in contact with the leather of the upper where it laps over the inner sole (the same being so as to hide the edges of the cork) and the soles, cork, and upper be united by sewing or nails, as specified.

I also claim the improved manufacture of water-proof sole for boots or shoes, it being composed of leather and cork arranged with a border or a piece of leather circumscribing the cork, as and for the purpose set forth.

55,672.—HORSE RAKE.—Jacob King, Omaha, Nebraska:

I claim the rake provided with sets of teeth on each side of the head and drawn by means of the reversible swinging frames, K, constructed and operating substantially as described and represented.

55,673.—WINCH CAPSTAN.—David Knowlton, Camden, Maine:

I claim the combination as well as the arrangement of the capstan, A, the capstan-head, D, and two or any other suitable number of winches applied to such head and provided with mechanism for revolving them separately from the capstan.

I also claim the arrangement of the head, D, with the capstan, A.

I also claim the combination as well as the arrangement of the internal ratchet, P, and its pawl, e, traveling pinion, O, the drawing pinion, R, the ratchet, K, and pawl, L, and also the combination of such additional power mechanism with each winch, F, the head, D, and the capstan, A, or the same and the holding ratchet, G, and pawl, H, of the winch.

I also claim the combination as well as the arrangement of the head, D, with the two winches and their operative mechanism, as specified.

I also claim the combination of the two holding ratchets, G, G, and their retaining pawls, H, H, with the two winches, their shaft and operative mechanism as applied to them, their shaft and the capstan head, substantially as specified.

55,674.—UPSETTING PRESS.—Andrew Kloman, Pittsburg, Pa.:

I claim, 1st, The top-piece, C, with its side projecting ledges, d, d, and inclined top when used in an upsetting press, as described and for the purpose specified.

2d, The combination of the two wedges, D, D′, screws, S, S, frame, A, plate, E, and piece, C, arranged as specified and for the purpose already described.

3d, The combination of the two pieces, G, G, with the piece, C, and bed, B, as described and for the purpose specified.

4th, The mode of forcing down and holding stationary the piece, C, and of preventing the pieces, G, G′, from spreading apart at one and the same time by use and means of the screws, S, S, wedges, D, D′, inclined top-piece, C, plate, E, and ledges, d, d.

5th, The plunger, I, having two points or projecting angles, i, i, and notches, g′, g′, as described and for the purpose already mentioned.

6th, The combination of the fly-wheels, K, K, shaft, k, k, cam, L, box, b, yoke, M, wedge, W, and bolt, J, for obtaining from a motive power comparatively small an enormous pressure and long throw in a short space of time, variable in intensity to any desired degree of power or speed by the single motion of the wedge, W.

7th, The combination of the bars, q, q, piece, Q, pieces, R, R, plates, T and S, and pieces, r, r, and T′, T′, as described and for the purpose specified.

55,675.—PORTABLE BOAT.—R. Knudsen and W. S. Lassoe, Brooklyn, N. Y.:

We claim, 1st, A portable boat composed of two water-tight floats connected substantially as herein described, whereby they may be drawn apart to give the necessary stability for use, and closed together to afford facility for transportation.

2d, The combination with a double boat of the movable frame, B, constructed and applied substantially as herein set forth for the purpose specified.

3d, The seat, C, having row-locks, r, arranged over the space between the two hulls of the boat when the said hulls are extended and held apart, substantially as herein set forth.

55,676.—PRIMING METALLIC CARTRIDGES.—Theodore T. S. Laidley, Springfield, Mass.:

I claim the combination of the cartridge case with an anvil, A, which is of such shape that it holds the percussion cap in a central position within the case against the head, and is held firmly in its place by resting against a shoulder formed in the case below the head, after the anvil has been inserted, in the manner and for the purpose above described.

55,677.—SERVING TABLE.—William L. Lance, Plymouth, Pa.:

I claim, 1st, The moving table, b, combined with one or more stationary tables, a, a, for dining and other use, substantially as set forth.

2d, Moving tables, b, in combination with one or more pantry or furnishing or receiving rooms, P, in the manner described.

3d, The moving table, b, and stationary tables, a, a, so arranged having an open space, Q, forming a room on the inside or inner part of the tables, a, a, b, as described.

4th, In combination with the tables, I claim a passage-way, i, either under or over tables, a, a, b, by stairs or otherwise, substantially as set forth.

5th, Dividing the tables, a, a, b, into sections substantially as set forth.

6th, In combination with the tables, I claim the application of a flanged wheel, R, or its equivalent, to support, guide, and steady a moving table, b, for dining and other uses, substantially as set forth.

7th, In combination with the moving table, I claim the fixed shaft, x, to the leg, H, of the tables, a, a, supporting tables, a, a, upon which shaft, x, is wheel, R, to guide movable or moving table, b, substantially as and for the purpose set forth.

8th, The application of a belt, S, or its equivalent, to the driving of a movable or moving table, b, for dining and other uses, substantially as set forth.

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55,678.—BED-BOTTOM.—S. E. Lamphear and H. H. Blair, Brunswick, Ohio:

We claim the elastic loop, B, pin, I, and collar, D, as arranged and in combination with the slat, A, staple, F, and cleat, G, for the purpose and in the manner set forth.

55,679.—FORMING METALLIC CHARACTERS ON PAPER, ETC.—John Lanza, New York City:

I claim the above-described writing-fluid for the purpose of making metallic or other dust (or metallic or earthy mixtures) adhere to the writing, and thus give metallic letters, substantially in the manner and for the purposes set forth.

I also claim the above-described writing as a new and useful improvement, when the above-described fluid is employed substantially as described.

55,680.—SPRING BEDSTEAD.—Rufus Lapham, New York City:

I claim the center-piece, a, or its equivalent, with the interstices, b, b, b, the springs, c, c, c, with their slots, the cross-pieces or springs, d, d, d, with their pins, e, e, fitting in the slots of c, c, c, in combination, operating substantially as described and for the purposes set forth.

55,681.—ADJUSTABLE MANDREL.—Charles W. Le Count, Norwalk, Conn.:

I claim the arrangement of the sliding keys, F, socket, B, and thimble, C, in combination with the mandrel, A, in the manner and for the purpose substantially as herein described.

55,682.—PHOTOGRAPHIC APPARATUS.—Charles A. Leech, Philadelphia, Pa.:

I claim, 1st, The combination and arrangement of the dark chamber, F, with the camera box by means of the sliding frame, G, substantially in the manner above described and for the purposes set forth.

2d, The combination of the dark chamber, F, with the bath-case, A, and baths, B, C, D, E, by means of the sliding frame, G, the said parts being constructed and arranged in relation to each other substantially as described, so that the said chamber may be brought successively into its vertical and horizontal positions with all the baths for the immersion of the plate into the same and its removal therefrom, without removing it from its fixed position in the dark chamber, as and for the purposes above specified.

3d, Constructing the baths, B, C, D, E, with the slots, b, and hinged lids, d, substantially as and for the purposes above described.

4th, The combination and arrangement of the opaque valve, M, with the dark chamber, F, for shutting out the light from beneath the latter when it is in its elevated position, substantially as described.

5th, The combination of the springs, I, I, with the sliding frame, G, for holding the latter in its vertical position with the baths by means of the recesses, i, in bath-case, A, substantially as described and for the purposes specified.

6th, The combination of the spring, H, having a pin or projection, j, with the sliding frame, G, for holding the dark chamber, F, in its elevated position, substantially as described.

55,683.—SILL AND WEATHER-STRIP.—Jeremy E. Lindsley, Goshen, Ind.:

I claim the metallic strip, D, having flanged edges, a, a and i, when applied to the sill of a door, as and for the purpose specified.

55,684.—PLOW.—C. M. Lufkin, Claremont, N. H.:

I claim, 1st, A cutter, I, of any convenient form operated and connected by an eccentric, M, shaft, N, tube, H, and slide-rod, K, to the mold-board, F, in such a manner as to admit of the oscillation of the cutter by the adjustment of the mold-board, as herein set forth.

2d, A tube, H, slide-rod, K, latch, L, spring, e, and catches, g, g, operating and arranged substantially as and for the purpose herein set forth.

3d, The pivot, f, on the cutter, I, in connection with the eccentric, M, and socket, J, all constructed, arranged, and operating substantially as and for the purpose specified.

55,685.—WATER-WHEEL.—T. W. Mahler, Rome, N. Y.:

I claim, 1st, The buckets, E, hinged on axes, b, in such a manner that they may be turned or adjusted, substantially as shown and described and for the purpose specified.

2d, Connecting the axes, b, of the buckets, E, by means of arms, F, to a ring, e, adjusted through the medium of the plate or lever, G, shaft, h, and a bit, i, on said shaft working in a hole, g, in a projection, f, of ring, e, all arranged substantially as and for the purpose specified.

3d, The shaft, l, provided at its lower end with a crank, u, and pin, o, in combination with the plate or lever, G, substantially as and for the purpose set forth.

4th, The scroll, A, having greater depth than the wheel or with its top and bottom plates, p, p′, respectively above and below the top and bottom rims, c, c′, of the wheel, substantially as and for the purpose specified.

55,686.—STREET LAMP.—Thos. T. Markland, Jr., Philadelphia, Pa.:

I claim, 1st, The combination of the screen and reflector, H, with the burner, E, and reflector, H′, substantially in the manner and for the purposes set forth.

2d, The combination of the globe, A, with the base, D, and roof, E, when said parts are constructed and arranged in relation to each other, substantially as described and for the purposes set forth.

3d, The combination of the reflector, H′, with the roof, E, reflector, H, and burner, B, substantially as described and for the purposes set forth.

4th, Constructing the globe, A, with the annular projection, m, for turning the water from the lamp, substantially as specified.

5th, Constructing the base, D, with perforations, f, and the roof, E, with the slots or openings, K, for causing a current of cold air to flow over the interior surface of the globe, A, to counteract the heat from the burner, B, substantially as described and for the purpose set forth.

6th, The combination of the cap, L, with the central tube, K, and the burner, B, when constructed and arranged to operate in relation to the draft of said tube, substantially as described.

7th, The perforated names in the sides of the cap, L, in combination with the burner, B, substantially as described and for the purpose specified.

55,687.—BENDING FLANGES UPON BOILER-HEADS.—William W. Martin, Alleghany City, Pa.:

I claim the construction and arrangement of the revolving table, B, and rolls, C, said table and rolls operating substantially as herein described and for the purpose set forth.

55,688.—BUTTON-HOLE SEWING MACHINE.—John McClosky, New York City

I claim the grooved cylinder, H, constructed substantially as described, for moving the needle forward and backward alternately, attached to or moved with the needle-arm of a reciprocating needle.

I also claim the grooved cylinder, H, in combination with the yielding finger, G, substantially as described.

I also claim the eccentric on the lower end of the grooved cylinder for alternately moving the needle forward and backward, substantially as described.

I also claim connecting the reciprocating needle, O, with the grooved cylinder by means of an arm, J, applied substantially as above described.

I also claim the hollow flange, j, on the under side of the presser foot in combination with the guide, Q, substantially as described.

I also claim the combination of the movable bed, S, with the loose guide, Q, operating in conjunction, substantially as described.

I also claim the combination of the supplementary hook, f, with the needle, O, and the devices which move it forward and backward, substantially as above described.

I also claim the horizontal lower needle, C, made and operated substantially as described, in combination with the revolving hook, and a reciprocating needle, O, moved forward and backward alternately, substantially as described.

55,689.—TRAVELING-TRUNK.—Alexander McDonald, Charlestown, Mass.:

I claim the combination of the leather covering, e, and the boards, c and d, arranged with respect to each other, and the bands, f and x, substantially as set forth.

Also, combining with the buckles upon the front side of the body and straps, which fasten the lid thereto, the auxiliary straining-loops substantially as described.

55,690.—SHIFTING BUGGY-TOP.—S. S. Meily, Lebanon, Pa.:

I claim the application of turn-buttons, g, g, which are constructed with screw-stems to the secondary seat, B, and main seat, A, these two seats being constructed and fitted together substantially as described.

55,691.—APPARATUS FOR WEIGHING GRAIN.—R. S. Morison, Bangor, Me.:

I claim, in combination with a scale-beam, the mechanism operated thereby to control the passage to the scale of material to be weighed, when constructed and arranged to operate in the manner shown and described.

Also, in combination with a scale-beam, a secondary lever or beam, as set forth, when arranged to suddenly release the scale-beam when the weight received by the scale equals the amount noted on its register, substantially as described.

Also, in combination with a scale-beam, as set forth, a slotted link to permit free motion of the beam to an extent sufficient to secure a momentum by which to actuate a controlling mechanism, as described.

Also, the arrangement of mechanism for changing the chute, substantially as described.

55,692.—RUB-IRON FOR CARRIAGES.—F. B. Morse, Milwaukee, Wis.:

I claim spring, D, in combination with shaft, C, and revolving rub-iron, A, substantially as and for the purpose described.

55,693.—DRILLING-MACHINE FOR WELLS.—Gorshom Mott, Big Run, Ohio:

I claim the tripping-beam, E, having its toe, E″, shaped as shown in combination with the crank, D, substantially as and for the purpose set forth.

55,694.—METHOD OF PROTECTING PILES.—William J. L. Moulton, San Francisco, Cal.:

I claim the mode of protecting piles, by means of metallic covering and cement filling, as set forth and described.

55,695.—STAVE MACHINE.—Charles Murdock, Ellenville, N. Y. Ante-dated June 2, 1866:

I claim, 1st, The block-carrying frame, Q, with its supplementary frame, W, arranged together substantially in the manner described, and operating with regard to the saw, as and for the purpose specified.

2d, The arrangement of the swinging-arm, b, with its spring-pawl, ratchet-wheel, Z, adjustable plate, C, and fixed arm, T, connected through a pinion and rock-gear, or its equivalent, with the block-carrying frame, Q, and operating together substantially in the manner described and for the purpose specified.

55,696.—DRILL AND BLACKSMITH'S TONGS.—F. Nevergold and G. Stackhouse, Pittsburg, Pa.:

We claim, 1st, The new and improved tool which we call a drill tongs, constructed as described, or its equivalent.

2d, The combination of the tongs, A, B, with the frame, F, spindle, G, wheels, M. M, shaft, N, crank, O, and drill, K, as described, and for the purpose specified.

3d, The disk, D, on the tongs, A, in combination with the disk, E, the slots, g′, g′, and the bolts, H, H, for holding the frame, F, in different positions in relation to the tongs, A′, B′.

4th, The combination of the piece, R, with the jaw, B, of the tongs, A′, B′, constructed and applied one to the other as described and shown.

55,697.—COMPOSITION FOR CURING ROT IN SHEEP.—H. D. Niles and James C. Brooks, Bristolville, Ohio:

We claim the aforesaid compound formed of the above-named ingredients, in about the proportions and for the purpose herein set forth and described.

55,698.—BOOT OR SHOE.—Onesippe Pacalin, New York City:

I claim the combination of the inner and outer plates, A, B, heel-socket, E, plug, G, bolt, H, and fastenings, D, D, etc., constructed and arranged substantially as above described and represented.

55,699.—LIME-KILN.—Clark D. Page, Rochester, N. Y.:

I claim, 1st, The employment of water in coal-burning lime-kilns for the purpose of first steaming the coal, to produce a more perfect and economical combustion, and the absorption of all sulphurous acid gas of the coal by said steam and using the gases of the decomposed water in producing a greater degree of heat, substantially as described.

2d, The combination of the pans, c, c, and water-pipes, M, or equivalent, operating substantially as and for the purpose specified.

3d, The water-receptacles, f, f, in combination with the ash-pits, L, L, and grates, b, b, so arranged that the steam that is produced by the fire will pass upward around and through the grates to keep them cool, substantially as described.

4th, The partition, I, in combination with the particular form of the cupola at the base, the latter provided with the concaves, a, a and having the chamber on each side of uniform thickness, substantially as described.

5th, The arrangement of the recesses, N, O, and cold-air flues, k, k, in combination with the grates, b, b, and the sides of the furnace, the same opening directly over the grates, and so constructed as to furnish cold air and prevent clinkering, substantially as described.

55,700.—STOP-COCK.—C. C. Parsons, Boston, Mass.:

I claim a stop-cock, constructed with one or more closed air-tight chambers, d, operating in combination with the opening through the plug.

55,701.—COTTON-SEED HULLER.—John Perkins, Providence, R. I.:

I claim the combination and arrangement of the series of vertical ribs, d′, with the shell, C, its series of horizontal ribs, e, the cylinder, A, and its case, B, the whole being to operate together substantially as specified.

55,702.—SHINGLE MACHINE.—Charles L. Pierce, Buffalo, N. Y.

I claim, 1st, Reciprocating the block-carriage which feeds the block to the saw in an unequal progressive movement by means of the crank-pin, D, working in the slot of cross-head, D′, substantially as described.

2d, Imparting an equal progressive movement of the block-carriage by means of the diamond slot, L, and crank, D, and thereby giving an equal and uniform feed of the shingle block to the saw, substantially as set forth.

3d, Operating the movable dog-bar, G1, of the dogging device by a weighted bell-crank, G2, working in combination with the hinged lever, G4, on the bed-frame, in the manner described.

4th, Operating the movable dog-bar, G′, of the dogging device by the bell-crank, J, and opening bar, J2, working in combination with the stop-piece, J3, on the bed-frame, in the manner described.

5th, The arrangement and combination of the segment lever, K1, K2, with the bell-crank, G2, carrying-segment, K, and movable dog-bar, G′, for the purpose of operating the dog-bar by hand-power.

6th, The double taper cams, I, in combination with the tilting block-tables when arranged in relation to the block-carriage, and operated thereby in the manner and for the purpose set forth.

55,703.—STRAW-CUTTER.—Clark Polley, Sinking Springs, Ohio:

I claim, 1st, The levers, A′ and V, in combination with each other, with the knife, B, and sash-frame, J, K, and with the walking-beam, P, and driving-cam, O, the whole being constructed and arranged substantially as described and for the purpose set forth.

2d, The combination of the spring, X, with the shaft, T, and walking-beam, P, substantially as described and for the purpose set forth.

55,704.—TACK HAMMER.—Alvin Pond, Southington, Conn.:

I claim the hammer herein described, consisting of the head, c, constructed with a notched jaw, c, and having a corresponding jaw, d, attached thereto, provided with their respective handles and constructed to operate substantially in the manner herein set forth.

55,705.—SLEIGH.—T. W. Porter, Bangor, Maine:

I claim, 1st, The metallic coupling or bar-end, A, Fig. 1, substantially as and for the purposes specified.

2d, The metallic coupling or double T, marked B, Fig. 1, substantially as described and shown.

3d, Forming metallic sleigh standards with the socket, c′, Figs. 1, 3, and 4, in manner substantially as described and for the purposes specified.

55,706.—PROCESS OF PREPARING PAPER-PULP FROM STRAW.—John Priestly, New York City, and Thomas C. Bradbury, Poughkeepsie, N. Y.:

We claim, 1st, The process effected by a crushing machine used for the purpose of opening, splitting, and flattening the straw with a rotary steam boiler, as described.

2d, The process effected by a crushing machine used for the purpose aforesaid with the rotary steam boiler containing the paper stock, operated at about sixty pounds pressure, substantially as described.

3d, The process effected by a crushing machine used for the purpose aforesaid with the rotary steam boiler containing the paper-stock, and with a pulping engine (Kingsland or other), for the purpose of disintegrating the fibers, substantially as described.

4th, The combination of the rotary boiler containing the paper-stock operated at a pressure of about sixty pounds, for the period described, with a pulping engine (Kingsland or other), substantially as described.

5th, The combination of a crushing machine and boiler, containing the paper-stock operated at a pressure of about sixty pounds and with a corresponding temperature, for the period described, with a pulping engine (Kingsland or other), for the purpose of disintegrating the stock and producing a fiber suitable for the manufacture of paper without the addition of other stock, substantially as described.

55,707.—GRAIN DRILL.—A. Putman, Owego, N. Y.:

I claim, 1st, The changing of the machine from a grain-drill to a broadcast sower and from a broadcast sower to a grain-drill, by moving or adjusting the tooth-bars, K, to the feed-box, F, as above described, or its equivalent.

2d, Forming the teeth, G and H, from two different shaped patterns, which is to incline one forward and the other backward alternately, in the manner already set forth and described.

55,708.—STAVE MACHINE.—John J. Ralya, Alleghany, Pa.:

I claim, 1st, Setting the head-stock or knife-frame on journals, so that it may admit of a slight motion on its axis to accommodate its position to any twist or irregularity of shape of the stave which is forced between the knives in the operation of shaving.

2d, Placing the knives in a head-stock or frame susceptible of motion on its axis in such a way that the center of motion shall be and line between the inner face of the knives and between their back and edge.

3d, Limiting and regulating the range of motion of the knives by means of set screws, substantially as herein-before described.

4th, The use of the movable head-piece in the end of the ram so constructed and arranged as to be susceptible of a limited motion on its axis for the purpose of allowing the stave to turn in its passage through the knives to accommodate any twist or irregularity of shape of the stave.

5th, The use of a spring in connection with the movable head of the ram, so as to permit of its yielding slightly in the operation of forcing the staves through the knives, substantially as described.

6th, Crotching the end of the ram so as to hold the stave in place as it is being forced through the knives.

7th, The use, in combination with the cutters or knives and ram, of an upright pulley-post to carry the rope and weight for withdrawing the ram after the stave is pressed between the knives.

8th, So arranging the toothed rack of a ram as to be capable of adjustment towards or from the segmental gear-wheel for the purpose of regulating the length of stroke of the ram towards the knives, substantially as and for the purpose herein-before described.

9th, Giving to the knife-blades a concave curve from their outer edge, so as to form a ledge or shoulder for the purpose of turning the shaving or chip outwards at such an angle as to break it off just above the edge of the knife, substantially as herein-before described.

55,709.—FRUIT BOX.—Charles Reese, Baltimore, Md.:

I claim a box made of a single piece whose flaps are so bent up as to form sides which are secured together by eyelets, substantially as described.

55,710.—REDUCING METALLIC OXYDS.—Jacob Reese, Pittsburg, Pa.:

I claim, 1st, Deoxydizing metallic oxyds while in a molten or liquid condition, by means of hydrogen gas or a vapor of carbon or of hydro-carbon, or a mixture of such vapor or gas so that these oxyds or ores may be reduced to a metallic condition without the use of additional fuel, substantially in the manner herein-before described.

2d, The use of liquid petroleum or other liquid hydro-carbon in the manufacture of iron or steel and other metals, substantially in the manner and for the purposes herein-before described.

3d, The use of hydrogen gas for the purpose of deoxydizing metallic oxyds, substantially in the manner herein-before described.

4th, Making liquid wrought or malleable iron from the ore by subjecting the ore while in a melted condition to the action of hydrogen gas or hydro-carbureted vapor, or a vapor of carbon, or a liquid hydro-carbon, substantially as herein-before described.

5th, Making cast-steel by deoxydizing iron ore while in a molten condition, in the manner herein-before described, and subjecting the pure iron thus produced to a vapor of carbon or hydro-carbon, or adding thereto a liquid carburet or hydro-carbon, until the requisite amount of carbon is added, substantially as herein-before described.

6th, Making cast-iron by deoxydizing iron ore in a melted condition, in the manner described and supplying the requisite amount of carbon in a gaseous or liquid form, substantially as herein-before set forth.

7th, Refining iron and steel by means of a carbon in a gaseous or liquid form, to which, after the metal has been deoxydized thereby, a sufficient amount of air, water, or steam is added to support the combustion of the carbon thus added as fuel to the melted metal.

8th, Making a belly in the lower side of the deoxydizing chamber or reducer so as to hold the charge of melted ore away from the tuyere holes in the bottom of the reducer until the reducer is raised to admit the deoxydizing vapor or liquid, substantially as herein-before described.

9th, The use of a valve on one of the trunnions of the reducer constructed substantially as herein-before described, so as to shut off the deoxydizing vapor or liquid from entering the reducer, when in position to receive its charge, and open the communication when the reducer is restored to its position for working.

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10th, The use of gas-meters, in combination with the air-cylinder and vapor-generator and reducer, for the purpose of measuring the amount of deoxydizing vapor or air admitted to the interior of the reducing chamber, substantially as herein-before described.

55,711.—HYDRANT.—Joshua Regester, Baltimore, Md.:

I claim, 1st, Constructing the base of the cylinder, B, in such manner that this cylinder will be held in a permanent position within a divided case, A, A, between and upon base-supports or collars, a, a, substantially as described.

2d, The combination of a divided case, A, A, with a cylinder, B, which is constructed with a contracted neck, B′, and a pipe, D, leading to this neck below the base, a, a, all substantially as described.

3d, The construction of the hydrant case of two sections, A, A, two half base-pieces, a, a, and perforated portion, g, d, the said perforated portion being below the base, a, a, substantially as described.

55,712.—HYDRANT.—Joshua Regester, Baltimore, Md.:

I claim, 1st, The construction of the nut, D′, with an external flange, and with an internal flaring passage, in combination with the tapering plug-valve, F, packing, f, internal cylinder, B, and plunger, B′, all substantially in the manner and for the purpose described.

2d, Fitting the plug-valve, F, in a recess formed in conical seat, E, which is perforated near its circumference, all substantially in the manner and for the purpose herein described.

3d, The combination of the conical seat, E plug-valve, F, packing 1, f, perforations in the seat, E, and the nut, D′, all constructed and arranged substantially as described.

4th, Securing the packing, f, upon the seat, E, by means of a flange, c, and plug-valve, F, substantially as described.

5th, Applying the crank-rod, i, to a tubular bearing, j, having a flanged head, k, with stops, k′, k′, on its outer end, in combination with a crank-arm or handle, l, which has a stop, k2, formed on it all used in connection with the foregoing features of invention substantially as and for the purpose herein described.

55,713.—MOLD FOR CASTING PULLEYS.—William D. Rinehart, Pittsburg, Pa.:

I claim a flask made in two parts ("cope" and "drag"), each part being furnished with a chamber for heated air or steam, the whole being constructed, arranged, and operating substantially as herein described and for the purpose set forth.

55,714.—BUTTER-WORKER.—John Robinson, Calais, Vt.:

I claim the conical roller, B, b, and handle, C, fitted so that the handle may turn upon the roller, in combination with a sector-shaped tray A, A2, and cross-bar, d, substantially in the manner and for the purpose herein set forth.

55,715.—PREPARING HIDES, SKINS, FURS, ETC., FOR USE.—Julius A. Roth, Philadelphia, Pa.:

I claim the softening of leather, hides, furs, and the hair or wool thereon, by treating the same in a saponified solution, made in the manner as set forth and for the purpose as specified.

55,716.—GUN-STOCK.—Wm. Rudolph and A. Braun, San Francisco, Cal.:

We claim as our invention and improvement connecting the trigger to the sear by means of the hinged-arm, g, substantially as described.

And in combination with the trigger and hinged arm we claim the spring, i, substantially as described.

55,717.—BUCKLE.—Lomis W. Russell, Galesburg, Mich.:

I claim the ring or clasp, A, blocks, b and c, provided with a groove, and corrugated on their inner surface, being made of wood or metal, substantially in the manner and for the purpose herein set forth.

55,718.—DOUGH-KNEADER.—George W. Saunders, Springfield, Vt.:

I claim the combination of the roller, B, with its grooved end, a′, the block, C, pin, b, staples, c, c, hook, d, and board, A, arranged and operating in the manner and for the purpose herein described.

55,719.—BREECH-LOADING FIRE-ARM.—Adolf Sayer, Naubuc, Conn.:

I claim in combination with swinging breech-block, the hook, W, the groove, a, in which it is placed, and the groove, c, substantially as and for the purpose described.

55,720.—TEA AND COFFEE POT.—P. G. H. Schaffer, West Meriden, Conn.:

I claim the combination of the flange, k, with the embossed body, substantially as described.

55,721.—BILLIARD TABLE.—Peter Schouller, Boston, Mass.:

I claim the arrangement and combination of the channel, a, with the rail, B, and the elastic or caoutchouc strip, A, of a billiard table, the same being substantially as specified.

55,722.—NAIL-PLATE FEEDER.—Thomas A. Searle, Providence, R. I.:

I claim the cam substantially such as described, for giving the turning motion to the nail-plate, in combination with the vibrating feeder-frame for drawing back and lifting the nail-plate, that it may be turned, and returning it to the required position on the bed knife, substantially as described.

55,723.—PLANING MACHINE.—William Sellers, Philadelphia, Pa.:

I claim, 1st, The use in planing machines for metal of traversing uprights to support the cross-head, and upon which the cross-head may be elevated and depressed to suit the varying hights of the material to be operated upon, in combination with a fixed platform, provided with ways, slides, or their equivalents, arranged so as to avoid the necessity of raising the materials to be operated upon from the platform, so as to come within reach of the cutting tool, all constructed, arranged and operating substantially as describe

2d, Actuating the traversing uprights of the planing machines for metal herein described from a revolving shaft or shafts attached to and moving with the uprights, substantially as described.

3d, The use of an endless belt in combination with fast and loose pulleys, or their equivalents, when applied to the planing machines herein described, substantially in the manner and for the purposes specified.

4th, Reversing the direction of the movement of the cutting tool by means substantially as described and for the object specified.

55,724.—TRUSS.—Jacob A. Sherman, New York City:

I claim, 1st, The curved pressure-spring, a, introduced between the bars, b and c, and carrying the truss-pad, as specified.

2d, The clips, d, e, 3 and 4, to which the ends of the bars, b or c, are attached, in combination with the segmental slots and clamping screws for connecting the bars, b, c, to the respective springs, a, f, or g, and allowing for adjustment, as set forth.

3d, The inclined hinge, 11 or 12, for uniting the pad to the truss-spring, a, so as to allow the adjustment of the pad as specified.

4th, The lever, q, and screw 15, in combination with the lever, o, and diagonal hinges, 11 and 12, as and for the purposes set forth.

55,725.—FANNING MILL.—Levi Shultz, Upper Sandusky, Ohio:

I claim, 1st, Constructing a fanning mill with a suspended riddle-shoe, D, which in part extends above and below the fan-case, B, and forms the closed sides of the mill, substantially as described.

2d, Suspending the shoe, D, by a pivot, c, and providing it with springs, g, g, for equalizing its movements substantially as described.

3d, Providing the blast opening through the fan-case with adjustable slides, a, a, for regulating the force and direction of the blast, substantially as described.

4th, The combination of a fan-case, B, and a shoe, D, having side-boards applied to it, with an open supporting-frame, A, substantially as described.

55,726.—FEED-BAG.—Felix John Simeon, Brooklyn, N. Y.:

I claim, 1st, Constructing both the sides and bottom of a feed-bag of perforated metal or wire-cloth, substantially as and for the purpose set forth.

2d, The combination, with an open or perforated feed-bag, of the springs, F, F, and strap, E, substantially as and for the purpose set forth.

55,727.—CATTLE-TIE.—Henry C. Small, Portland, Me.:

I claim the combination of the bows, d and c, the bow, d, having the ring, h, and hooks, f, f, on its ends, the bow, c, the two hooks, K, K, and spring, S, all constructed, arranged, and operating as set forth.

55,728.—HEATING-STOVE.—Samuel Smith, Philadelphia, Pa.:

I claim, 1st, The ring, B, secured to the cylinder, D, constructed and adapted for attachment to the base or cap plate of a stove, substantially as described.

2d, The combination with the above of the base plate, A, with its openings, x, arranged as set forth for the purpose specified.

55,729.—SPITTOON FOR CARS.—Willison G. Smith, Carlisle, Pa. Ante-dated May 26, 1866:

I claim, 1st, an improved self-cleaning spittoon, formed by combining the box or cup, B, the cover, H, the arm, G, and sliding bottom, D, with each other, the parts being constructed and arranged substantially as herein described and for the purpose set forth.

2d, The combination of the spring, F, with the lower part of the spittoon and the sliding bottom, D, substantially as described and for the purpose set forth.

55,730.—MEDICAL COMPOSITION.—Thos. W. Speissegger, Charleston, S. C.:

I claim a medical compound composed of the ingredients herein specified, and in about the proportions named.

55,731.—VALVE-GEAR FOR STEAM-ENGINES.—Edwin Sprague, Alleghany City, Pa.:

I claim, 1st, The hinged lifters, n, said lifters being operated by means of triggers, r, and inclines, l, or their equivalents, and one cam-rod made in one or more parts, said lifters, triggers, inclines, and cam-rod being dependent for their action upon the cam, 18, and adjustable point, 17, substantially as herein described and set forth.

2d, The adjustable point, 17, when used in combination with a cam and cam-yoke and a single cam-rod for working a full stroke, and used for operating the cut-off gear of steam-engines, as herein described and set forth.

3d, The inclines, l, on plate, y, said plate and inclines being operated by lever, o, through the medium of a governor or otherwise, substantially as herein described and for the purpose set forth.

55,732.—INDICATOR FOR STEAM-GENERATORS.—Joseph H. Springer and William M. Bertram, Philadelphia, Pa.:

We claim, 1st, A cup, I, open at the top and suspended within a steam-generator, or in a tube communicating with the said generator, in combination with devices constructed and arranged substantially as herein described, whereby the said cup is caused to discharge a volume of steam when the water becomes low, as set forth.

2d, The combination of the tube, A, its cup, I, steam-whistle, J, spring-valve, G, and lever, H, the whole being arranged substantially as and for the purpose described.

3d, The combination with the above of the glass tube, F.

55,733.—PESSARY.—Israel Stealy Crestline, Ohio:

I claim the application of a rubber globe under the womb, to be filled with air after inserting the same, in order that it may press upward against the womb to prevent falling, weakness, and pain, thereby give ease, comfort, and strength to the suffering patient.

55,734.—KNITTING-MACHINE.—Alden B. Stillings, Springfield, Mass..

I claim, 1st, Constructing the crank in such a manner as to obtain a varying or adjustable thrust, substantially as described and for the purposes set forth.

2d, The use of the shaft, E, E′, having screw-threads cut upon them as described, in combination with the cam-stops, when arranged and operating substantially as set forth.

3d, Imparting to the four cam-stops the same relative motion by means of the chain-carriers and endless chain, or by any equivalent means, substantially as described.

4th, The combination of a crank constructed as set forth, with the mechanism described for adjusting the position of the cam-stops, substantially as set forth.

55,735.—DEVICE FOR UPSETTING TIRES.—Alonzo Stow, Calais, Vt.:

I claim a tire upsetting-machine, with self-adjusting jaws or holders, and operated by an eccentric or cam-lever, substantially as set forth.

55,736.—RAILROAD SWITCH.—Wm. J. Stowell, Baltimore, Md.:

I claim, 1st, The construction of the movable guard, E, with a projecting tongue, f, in combination with the swelled head, e, of this guard, and the two rail sections, A, D, arranged to operate substantially as described.

2d, The combination of the rail section, D, which is constructed with an enlarged head, c, and inclined plane, c′, with the guard, C, and the web or bridge, a, substantially as described.

3d, The movable switch-rails, D, E, when constructed substantially as described, and combined with stationary guide-rails on the opposite side of the track, substantially in the manner and for the purposes specified.

55,737.—BEVERAGE.—Christopher Sussegger, New York City:

I claim, 1st, The "American Sherbet" as a new article of manufacture.

2d, The manufacture of a beverage by a process substantially as herein-before set forth and described.

3d, The combination of water, sugar, tartaric acid, yeast, linden blossoms, and rose leaves or their equivalents, for the production of a beverage or Sherbet," substantially as herein-before set forth and described

55,738.—SAWING MACHINE.—Zuriel Swope, Lancaster, Pa..

I claim operating a reciprocating saw by means of a treadle and the devices connected thereto, when they are constructed and arranged to operate in the manner and for the purposes substantially as specified.

55,739.—SCREW-WRENCH.—George C. Taft, assignor to T. H. Dodge, Worcester, Mass.:

I claim, 1st, The combination with nut, E, having a flange, e, of the jaw, D, and its stirrup, f, substantially as set forth.

2d, The combination with the front of nut, E, of the shoulder c, on jaw, D, as and for the purposes set forth.

3d, Beveling off the front of flange, e in combination with beveling off the rear of stirrup, f, as seen at 3 in the accompanying drawings.

55,740.—MANUFACTURE OF FLEXIBLE TUBING.—Wm. B. S. Taylor, New York City:

I claim as my invention and improvement in flexible tubing for illuminating gas, the combination in a flexible gas-tube of a layer or layers of animal membrane coated with glue or other suitable gelatinous cement, substantially as described, and for the purpose of resisting the penetrative action of the gas and its fluids.

55,741.—APPARATUS FOR CARBURETING AIR.—John B. Terry, Arburndale, Mass.:

I claim the improved air-forcing apparatus, made substantially as described, viz., not only of the two wheels, A, B, having their buckets arranged as explained, but of the case, E, provided with the chambers, I, K, L, the connecting tube, H, and the induction passage, G, as set forth.

55,742.—GRAIN DRILL.—J. H. Thomas and P. P. Mast, Springfield, Ohio:

We claim, 1st, The hopper A, attached to the central or stationary bar, B, in combination with the adjustable bar, E, substantially as shown and described.

2d, The adjustable tubes, I and J, arranged to operate in combination with the stationary hopper, and adjustable bars, substantially as and for the purpose set forth.

3d, The slide, l, when arranged to operate in combination with the rod, f, and hopper, A, as herein described.

4th, The agitators, a, having a to-and-fro movement over the openings of the hopper, A, as shown and described.

5th, We claim the tube, I, having its upper end enlarged, and so connected to the hopper, A, as to cover the opening therein, and receive the seed therefrom, at all adjustments of which the bars, E, are capable.

6th, Pivoting the tube, I, to the hopper, A, and the tube, J, to the bar, E, and having the tubes, I and J, arranged to slide upon each other, substantially as shown and described.

55,743.—REVOLVING FIRE-ARM.—Wm. Tibbals, South Coventry, Conn.:

I claim constructing the chamber of fire-arms with the groove or slot in its side, for the reception of the pin-cartridge, substantially as herein shown and described.

55,744.—CLOTHES POLE.—Francis W. Tilton, New Bedford, Mass.:

I claim a clothes-pole having one of its ends provided with a double hook B constructed substantially as shown and described.

55,745.—LAMP WICK.—Cyrus L. Topliff, New York City:

I claim the application to a lamp wick of a solution of gum and alum, for the purpose described.

55,746.—APPARATUS FOR COOLING AND CONDENSING BEER, ALCOHOL, ETC.—John Trageser, New York City:

I claim the mode herein described of constructing volute condensers or coolers by the introduction of a strip of metal between the edges of the sheet-metal divisions, and soldered together in the manner specified.

55,747.—COIL FOR BREWERS' BOILERS.—J. Trageser and J. G. Schreiber, New York City:

We claim the steam-pipe, b, and condensation pipe, c, provided with the couplings, e, e and g, g, in combination with the coils, f, f, substantially as and for the purposes set forth.

55,748.—CLAY AND PEAT PRESS.—B. Van Vranken, Schenectady, N. Y.:

1st, In a machine for molding clay and peat, employing a vertical pug-mill, or mixing-box, B, and a press-box, D, I claim the adjustable pusher F, applied to a table, E, for moving the mold boxes from the rear to the front end of said table, substantially as described.

2d, The combination with an upright pug-mill, B, press-box, D, and a table, E, I claim the rack-bars, G, G, oscillating sectors, H, H, and a pitman-rod, J, connecting with the main-shaft, C, substantially as described.

55,749.—LATHE-REST FOR TURNING BALLS.—William T. Vose, Newton, Mass.:

I claim the arrangement of the adjustable base, A, revolving-cap, B, with the hinged-stock, H, set-screw, E, cutter, F, and handle, H, substantially in the manner and for the purpose set forth.

55,750.—WATCH.—Arthur Wadsworth, Newark, N. J.:

I claim, 1st, The combination of the gear-wheels, O and Q, respectively hung to arms, T and T2, with the pendant spindle, H, main-spring axis, M, and arbor, N, of a watch-movement, when arranged together so as to operate substantially as and for the purpose described.

2d, The combination of the pindle, H, and pusher-sleeve, E, arranged together substantially in the manner described and for the purpose specified.

55,751.—STOVE DAMPER.—George W. Walker, Boston, Mass.:

I claim in combination with a foraminous plate or gauze, through which air is admitted at the front of the stove for the support of combustion, a provision for regulating or shutting off the admission of such air, substantially as set forth.

55,752.—BREECH-LOADING FIRE-ARM.—H. F. Wheeler, Boston, Mass.

I claim, in combination with the breech-block and single hammer, the two breech-loading barrels of varied caliber when so hung upon the breech-pin as to permit either barrel at will to be brought into position with respect to the hammer, for firing, and to be slid longitudinally on said pin for expulsion of the cartridge-shell and insertion of a cartridge, substantially as set forth.

55,753.—BUTTON-HOLE FOR PAPER COLLARS.—Nathaniel T. Whiting, Lawrence, Mass.:

I claim the lateral slots, c, or cuts, d, d, combined with the button-holes, A, substantially as and for the purpose specified.

55,754.—BURGLAR ALARM.—Horace Wickham, Jr., Chicago, Ill.:

I claim the operating of the clock-alarm by means of the arm, H, support, U, standard, F, and screw, I, when constructed substantially as set forth and operated as described.

55,755.—NAIL-PLATE-FEEDERS.—James L. Wiggin, South New Market, N. H., assignor to John W. Hoard, Bristol, R. I., and George B. Wiggin, South New Market, N. H.:

I claim, 1st, Combining in a movable frame with a nail-plate feed-bar the wheels and other means of transmission whereby the rotary and vibratory up-and-down and back-and-forth motions are directly imparted to the feed-bar, the whole being constructed and arranged for operation substantially as herein shown and set forth.

2d, The sleeve for holding the feed-bar in the movable frame, as described, in combination with gear-wheels, one of which is mounted on said sleeve under the arrangement herein shown and described, whereby an intermittent rotary movement is imparted to the feed-bar.

3d, In combination with the sleeve for holding the feedbar as described, I claim the spring spline in combination with a slot or groove in said bar, substantially as set forth.

4th, Pressing the feed-bar against the gauge-plate of a cutting-apparatus by spring-power, mechanism, or the equivalent thereof, when applied through the intermediary of an arm mounted on a sleeve capable of a rotating and sliding movement on a rod parallel to the feed-bar, substantially as herein shown and described, so

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that the feed-bar may be instantly disengaged at the pleasure of the operator.

5th, Effecting the movements of rotation, lifting up and drawing back of the feed-bar in the manner herein described, the various devices for this purpose used being actuated by a single disk provided with cams and pins, as herein shown and set forth.

6th, In combination with the movable frame which carries the feed-bar and the intermediate support, I claim the disk provided with cams, whereby the movable frame is actuated to cause the feed-bar to be lifted between each stroke of the cutting apparatus, as set forth.

7th, Pivoting the dogs or jaws for grasping and drawing back the feed-bar, as described, to a slide secured in the top of the vibratory frame, and constructed and arranged as set forth.

8th, In combination with the dogs or jaws pivoted to a slide in the top of the movable frame, I claim the vibrating yoke hinged or pivoted to the stationary frame, and actuated by the lever as described, to cause the alternate opening and closing and drawing back of the dogs or jaws, as and for the purposes herein shown and set forth.

55,756.—Globe-cock.—Joseph Worcester, Newport, Ky.:

I claim the valve, C, adapted to rotate in the manner substantially as described, on the stem, G, and provided with a rigid stem, D, operated from the outside, in the manner and for the purpose specified.

55,757.—Fastening Ventilators.—Max Zabel, Milwaukee, Wis.:

I claim the springs, e, e, e, securing the ventilator in place, when arranged and applied as shown and set forth.

55,758.—Harvester.—William Zimmerman, Oskaloosa, Iowa:

I claim the combination of the door, B, screw-rod, b, counterpoise, C, spring catch, E, cord, d, bar, f, rake, D, and pivoted arm, g, arranged relatively to each other and with the endless carrying apron-roller, a, and operating in the manner and for the purpose herein specified.

55,759.—Tobacco Press.—James W. Barber, assignor to himself and Elisha P. Strout, Cincinnati, Ohio:

1st, In the described combination with a reciprocating plunger, I claim the bottomless pressing-box or trunk, substantially as set forth.

2d, In combination with the elements of the clause next preceding, I claim the bands, H, and set-screws, ', or their equivalent.

3d, The arrangement of two or more shiftable pressing trunks adapted to be brought alternately or successively in connection with a single plunger.

55,760.—Sausage stuffer.—Purmort Bradford, assignor to Sargent & Co., New Haven, Conn.:

I claim the combination and arrangement of the outer case of the form described, constructed in two parts, A and B, hinged together as specified, having a hopper, H, on the one part, and an outlet, I, on the other part, with the cylinder, E, and piston, F, constructed and arranged to operate substantially in the manner and for the purpose herein set forth.

55,761.—Packing Projectiles for Rifled Ordnance.—Lewis Wells Broadwell, New Orleans, La., assignor to C. M. Clay, Kentucky:

I claim the described method of wrapping the projectile by belts of cord which occupy detached annular recesses around the ball.

I also claim the application of the said fibrous covering of pulverized graphite or plumbago to serve as a partial protection to the fiber, as and for the purpose described.

55,762.—Breech-loading Ordnance.—Lewis Wells Broadwell, New Orleans, La., assignor to C. M. Clay, Kentucky:

I claim, 1st, The permanently located, self-acting, conical or curved gas-ring in combination with a wedge-shaped breech-block, which moves in a line at right angles to the axis of the gun to secure the gas-ring in position.

2d, The combination of a conical or curved gas-ring, as described, with an adjustable bearing-plate, D, in the face of the wedge-shaped breech-block.

3d, In combination with the adjustable bearing-plate, D, I claim an intervening softer material or cushion inserted between the block and the bearing-plate, for the purpose described.

55,763.—Harvester.—Francis C. Coppage, assignor to himself and Wm. Coppage, Terre Haute, Ind.:

I claim, 1st, The jointed lever, e, g, adjustable vertically at the end by means of the slot, set screw, and pivot, k″, k′, and as to working length by the sleeve and set screw, t, t′, substantially as described.

2d, The jointed connecting-rod, 8, 9, 10, in its relation to the winding devices at the inner and outer ends of the platform, substantially as and for the purpose described.

3d, The arrangement of the sliding-frame, S, guides, T, T, leg, R, caster-wheel, Q, shoe, P, in combination with the jointed shaft, 8, arranged and operated in the manner and for the purpose set forth.

55,764.—Brush.—Alanson C. Estabrook, Florence, Mass., assignor to J. S. Parsons, of the same place, and Geo. A. Scott, Lansingburg, N. Y.:

I claim as a new article of manufacture the brush constructed and arranged as herein described, that is to say, a brush in which the bristles inserted through a perforated plate are imbedded and held firmly in a cement of any suitable substance as described, which cement shall at the same time, in combination with a strip of metal or other material, form the back and handle of the brush, as herein shown and set forth.

55,765.—Hay Knife.—Francis J. Fischer, Hamilton, Ohio, assignor to himself and John B. Berning, Cincinnati, Ohio:

I claim the hay knife constructed as described, with a shank, A, diverging blades, B, B′, and a short middle blade, C, the whole adapted to cutting hay from the stack, substantially as described.

55,766.—Whirling-jack for Toys.—F. W. Flagg, assignor to himself and E. B Manning, Middletown, Conn.:

I claim the combination of the spring, D, with the barrel and spindle of a whirling-jack, when constructed and arranged to operate in the manner herein described, so as to rewind the cord, as specified.

55,767.—Capping Wood-screws.—John Gardner, assignor to Chas. T. Grilley, New Haven, Conn.:

In the manufacture of capped screws, I claim for operation upon screws for this purpose specially provided with a notch in their shanks, the punching apparatus and spring-catch or equivalent mechanism, as described, so that the screw, when capped, may be adjusted in its proper relation to and its cap nicked by the punch, substantially as and for the purposes herein set forth.

55,768.—Hoop-skirt.—Thomas S. Gilbert, assignor to himself and Perkins, Cooke & Co., New Haven, Conn.:

I claim inclosing a cord upon the wire substantially in the manner described, so that the hoop and tape may be screwed as and for the purpose specified.

55,769.—Broom-head.—George W. Golay, assignor to himself and Eli T Ogle, Vevay, Ind.:

I claim, 1st, The hinged clamp, B, composed of parts, B′, B″, loop, D, and pawl, E, constructed and operating substantially as and for the purpose specified.

2d, In combination with the above, I claim the sliding-clamp, C, composed of parts, C′ C″ and link, c, as set forth and for the purpose specified.

55,770.—Paddle-wheel.—William H. Holland, assignor to himself and William Goodman, Boston, Mass.:

I claim the arrangement and combination of the series of auxiliary floats, D, D, with the wheels, A, A, and the series of main floats, C, C, C, formed and arranged substantially as described.

55,771.—Lamp.—David Howarth, assignor to himself and W. N. Gourley and S. C. Rundlett, Portland, Me.:

I claim inserting into a lamp, constructed of any opaque substance, a transparent ring, of the form, in the place, and manner, and for the purpose substantially as set forth.

55,772.—Operating Hammers and Stamps.—Christopher R. James, assignor to himself and N. W. Condict, Jr., Jersey City, N. J.:

I claim operating a stamp or hammer by means of a piston working in a cylinder, the upper end of which is opened at proper intervals to a steam-boiler and to the atmosphere alternately, and the lower end of which is in constant communication with a reservoir of compressed air, substantially as herein specified.

And, in combination with two stamps or hammers so operated by pistons working in separate cylinders, I claim a valve and passages so opened as to bring each cylinder alternately in communication with the boiler, and so produce the action of the pistons and their attached hammers, substantially as herein specified.

55,773.—Propeller for Steamship.—Charles Kinkel and Martin Hubbe, New York City, assignor to Charles Wehle, Hoboken, N J.:

We claim, 1st, The combination of a number of nozzle-pipes, with the hull of the vessel, when each one of said pipes is connected with a pump and engine, substantially as described.

2d, The mechanism for connecting and turning the nozzle-pipes, substantially as described and for the purpose set forth.

55,774.—Registering Apparatus for Printing Presses.—James Kirk, Dover, Del., assignor to R. Hoe & Co., New York City:

I claim a feed-board for printing presses composed of two parts connected by a joint, one part being fixed and the other part movable so as to work on the joint in connection with a fixed or stationary pin or point connected with the fixed part of the feed-board, and a pin or point connected with the movable part of the same, all arranged to operate in the manner substantially as and for the purpose set forth.

55,775.—Instrument for Imitating the Skin.—Friederich Klee assignor to Louis Klee, Williamsburg, N. Y.:

I claim the arrangement of the screw, f, piston, d, spring, a, nut, g, and handle, c, applied relatively to the cylinder, A, combined and operating in the manner and for the purpose herein specified.

2d, The diaphragm, h, in combination with the cylinder, A, and pricks, b, constructed and operating substantially as and for the purpose set forth.

55,776.—Tree-protector.—William and David McCaine, assignors to themselves and Daniel McCaine, Groton, Mass.:

We claim as our improvement in the tree-protector, the arrangement of its plates of glass so that each two which are next adjacent shall make an angle with each other in a vertical direction at their junction.

We also claim the arrangement of two of such glass plates in a groove or rebate, and so as to meet together and make angles with each other in a vertical direction.

We also claim the arrangement and combination of the passage, h, and its holes, k, k, in the top-plates of glass, c, c, d, d, arranged as specified.

55,777.—Method of burning Gas.—John C. McNulty, assignor to himself and Thomas Lee, San Francisco, Cal.:

I claim the burning of jets of inflammable gas in combination with clinkers, substantially as described.

55,778.—Apparatus for carbureting Air, Gas, etc.—A. C Messenger, assignor to himself and A. T. Smith, Syracuse, N. Y.:

1st, In an apparatus for carbureting gas for illuminating purposes, I claim the use of double perforated walls, d, d, having a suitable capillary substance confined between them, said walls being so arranged as to form a porous division through which the gas is forced, substantially as described.

2d, The forming of two apartments in a vessel, A, by means of an upright double wall partition, which is rendered sufficiently porous to allow of the absorption of the fluid in said vessel, and the passage of gas through it, substantially as described.

3d, Subdividing the chamber, C, by means of a partition which is applied on one side of the induction passage, a, for the purpose and in the manner substantially as described.

55,779.—Operating Beater or Power-press.—Charles Nelson, assignor to himself, James W. Taylor, Wm. R. Brown, and Fred. W. Banks, Newburg, N. Y.:

I claim, 1st, Automatically throwing the clutch, d′, out of gear from the wheel, d, by the descent of the follower during the operation of pressing, for the purpose of preventing said follower from descending too far, substantially as described.

2d, The combination of the follower, c, rope, g, drum, r, screws, b3, b3, shaft, b2, and a continuously revolving shaft, e, all arranged and operating substantially as described.

3d, The combination of the loose wheels, a, d, and clutches, a′, d′, with the shaft, e, and the two wheels, b, c, on the reversible shaft, b2, substantially as described.

4th, So constructing a baling-press that a rapid vertical movement can be communicated to the follower, or the follower brought down upon the bale or compressed mass with a dead pressure from a main driving-shaft which has a continuous movement in one direction, substantially as described.

55,780.—Harvester.—Daniel G. Norris, assignor to himself, John H. Paddock, and Rufus S. Merrill, St. Johnsbury, Vt.:

1st, In mowing machines constructed and operating substantially as herein described, I claim the combination with the recessed sliding-bar provided with friction rollers, as herein-before described, of the cam-wheel on the pinion-shaft, said sliding-bar communicating its movement to the cutter-bar through the medium of a connecting rod or pitman hinged to the sliding-bar, as set forth, the whole being arranged and operating substantially as shown and described.

2d, In combination with the recessed sliding-bar, as described, I claim the pinion-shaft revolving in bearing on the cutter-frame, when arranged relatively to the driving pinions, as set forth, and having the cam-wheel located within and the self-adjusting clutches without the cutter-frame, upon the said shaft, as and for the purposes herein shown and described.

3d, In mowing machines, arranged and operating as described, I claim attaching the whiffle-tree directly to the metal cutter-frame and shafts to the wooden frame, as and for the purposes herein described.

55,781.—Harvester.—David M. Osborne, assignor to himself and Wm. A. Kirby, Auburn, N. Y.:

I claim connecting the pitman of a harvesting machine to the head of the cutter-bar or cutters, or connecting bars to their supports by means of a single pin, and retaining said pin in place by means of a self-adjusting, perforated spring, substantially as above described.

55,782.—Hydrant.—Agur Pixley and John Robertson, assignors to Robertson, Dow & Company, Brooklyn, N. Y.

We claim the ring, I, formed with a hole or opening, n, and arranged upon the hollow valve-stem, D, with reference to the hole or opening, r, thereof, in combination with the valve-stem, D, and valve-box, C, substantially as herein set forth for the purpose specified.

55,783.—Machinery for finishing Coffin Nail and Screw-heads.—Augustus A. Randall, assignor to Sargent & Co., New Haven, Conn.:

I claim, 1st, The combination of the spindles, F and I, fingers, N, and channel E, constructed and arranged to operate substantially in the manner and for the purpose specified.

2d, In combination with the above, I claim the cutter, b, mill, f, and a burnisher, substantially as and for the purpose specified.

55,784.—Stop-cock.—Francis Roach, assignor to himself and Joseph Zane, Boston, Mass.:

I claim the arrangement and combination of the socket, c, the guide, b, the valve, A, the spring, B, the valve-seat, i, the induction chamber, E, the eduction chamber, F, the pivot, a, the key, G, the neck, H, the screws, f, g, and the induction and eduction passages or pipes, l, m, the whole being as specified.

55,785.—Steam Generator.—M. M. Rounds, New Haven, Conn., assignor to himself and William Zellner, New York City, and J. E. Jerold, Jersey City, N. J.:

I claim the tubes, d, arranged in the crown-sheet, C, so as to open into the fire-box, substantially as and for the purpose, specified.

55,786.—Sabot.—F. W. Schroeder, assignor to himself and W. H. Hoskins, Philadelphia, Pa.:

I claim, 1st, The sabot composed of the sole-piece, A, and heel-piece, B, connected together by a metal strip, D, bent to conform, or nearly to conform, to the shape of the sole and heel of a boot or shoe, and having a shoulder, a, and turned-up end, b, all substantially as described.

2d, The combination of the strip, D, and its hooked end, e, with the transverse strip, E and its hooked ends and sole-piece, A.

3d, The transverse strip, F, having hooked ends, and being arranged to slide on the strip, D, as set forth for the purpose specified.

55,787.—Cotton Gin.—Charles Spofford and C. H. Hersey, assignor to themselves, W. E. Hawes, and Francis C. Hersey, Boston, Mass.:

We claim the employment of the triangular-shaped bar, K, in combination with the rolls, G, H, and combs, N, operating substantially as and for the purpose set forth.

We also claim the triangular-shaped bar, K, with its projecting ledge, l, substantially as and for the purpose described.

55,788.—Smut Machine.—R. C. Swann, assignor to himself, John L. Riter, and T. Jefferson West, Brownsville, Ind.:

I claim the reciprocating perforated bed or screen, A, in combination with the pressure-rollers, B, having a rough periphery, and their journals fitted in springs, C, all arranged to operate in the manner substantially as and for the purpose set forth.

55,789.—Rigging-stopper.—Henry Thompson, assignor to himself, D. C. and C. H. Haskell, Rockland, Maine:

I claim the rigging-stopper made and for use substantially as herein-before described, that is to say, of the toothed sectional lever, the rack, and the movable supporting-arm, and the two jawed levers, arranged and applied together in manner and so as to operate as explained.

55,790.—Swaging Machine.—James H. Tobey, assignor to himself and Alfred E. Tenney, Cranston, R. I.:

I claim the duplex plunger, composed of two independent plungers, D and E, having coincident axes operating relatively to each other, as described, in combination with the die, C, constructed and arranged substantially as and for the purpose specified.

55,791.—Milk-can.—Isaac F. Van Duzer, assignor to himself and R. M. Sayer, Middletown, N. Y.:

I claim, 1st, The manner herein set forth of attaching the breast to the body of the can, viz., by having the breast-piece confined between the body and hoop, as and for the purposes described.

2d, The manner of constructing the bottom part of the can, of the two hoops, and body and bottom, as herein recited.

3d, The manner of securing the body-piece and the hoops together, by first riveting them and then dipping them in the melted solder, as set forth.

55,792.—Grinding Mill.—Jules Aubin, Paris, France:

I claim constructing mill-stones with metal boxes or compartments let into the stone, and covered with metallic or other cloth, substantially in the manner and for the purposes herein-before described.

55,793.—Artificial Eye.—Auguste Boissonneau, Paris, France:

I claim the shaping or forming artificial eyes in enamel, with a hollow, c2, in the lower internal section, so that the lower section is symmetrical to the upper one, for the purpose, as herein-before set forth, of using the said eyes on either side, as substantially described.

55,794.—Machine for making Hinges.—Jean Baptiste Errard and Jean Pierre Boyer, Paris, France:

We claim, 1st, The arrangement of the spring-dogs, b, reciprocating carriage, c, in combination with the slotted rod, e, with its cam-slot, d, the lever, e^3, dovetailed strips, h, operating in the manner and for the purpose herein specified.

2d, The punches, l, and knives, r, in combination with the cams, n, levers, o, and with the guide grooves through which the blanks are fed, constructed, and arranged substantially as and for the purpose set forth.

3d, The bending tools, s, and grooves, a′, in combination with cams, v, and levers, w, constructed, arranged, and operating substantially as and for the purpose described.

4th, The arrangement of the dog, j, cam, l, lever, m′, constructed and operating in the manner and for the purpose specified.

5th, The operating lamp, a3, b3, in combination with the cam, d3, and lever, e_3, substantially as and for the purpose set forth.

6th, The adjustable guide-tube, i, arranged in combination with the mechanism for feeding-in and bending the plates and feeding the wire, substantially as and for the purpose specified.

7th, The countersinks, o′, o″, applied in combination with the mechanism for feeding-in, bending, and cutting-off the plates, substantially as and for the purpose set forth.

55,795.—Gunpowder.—Louis H. G. Ehrhardt, Bayswater, England:

I claim the combination of mineral carbon with catch, tannin, or gambier, substantially as herein described, to form a safety powder which may be rendered explosive at will by the addition of chlorate and nitrate of potash, in the proportions substantially as herein set forth.

I also claim the combination of tannin, or its equivalent, with

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mineral carbon, chlorate of potash, and nitrate of potash, substantially in the manner and for the purpose herein set forth.

55,796.—PROJECTILE.—Samuel H. Haycock, Ottawa, C. W.:

I claim an elongated pointed projectile with a cylindrical portion to fit the lands of the bore, and a conical rear, the center of gravity being in advance of the cylindrical portion.

55,797.—PHOTOMETER.—S. G. Elliott, San Francisco, Cal.:

I claim the combination of the tube, A, with the sliding, graduating tube, B, reflector, F, and rod, E, when said tubes, reflector, and rod are constructed in the manner and for the purpose as substantially described.

RE-ISSUES.

2,288.—MACHINE FOR PRESSING BONNETS, BONNET-FRAMES, ETC.—W. E. Doubleday, Brooklyn, N.Y., and J. Stewart, New York City, assignees by mesne-assignments of Wm. Osborn. Patented August 19, 1856; re-issued Feb. 17, 1857; again re-issued March 27, 1860:

We claim a pair of dies fitted to press the whole of a bonnet-frame, or similar article to be worn upon the head, at one operation substantially as specified, whether said bonnet-frame or similar article is formed of one or several pieces, and irrespective of the particular size or shape.

2,289.—EGG-PAN AND CAKE-BAKER.—The Russel & Erwin Manufacturing Company, New Britain, Conn., assignees of Nathaniel Waterman. Patented April 5, 1859:

We claim, as a new or improved article of manufacture, the baking-pan or arrangement of cups and a handle at each end of the series, all connected together and cast or founded in one united piece of metal, with heat-passages between the cups, and longitudinal, transverse, or circuitous channels on the underside of the same, substantially as herein-before described and set forth.

2,290.—MACHINE FOR GRINDING SAWS.—Emanuel Andrews, Williamsport, Pa. Patented Dec. 16, 1856:

I claim, 1st, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder roller bearing, and spring, substantially as set forth.

2d, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, and turning-frame for the grinder, substantially as set forth.

3d, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder, traversing carriage for the same, bearing for the article, and mechanism to move the grinder along the surface of the article with varying speed, substantially as set forth.

4th, The combination in a grinding machine of the following instrumentalities, viz. the revolving grinder, bearing for the article, and pattern-holder, of varying thickness at different parts of its length, substantially as set forth.

5th, The conibination in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, and pattern-holder, of varying thickness both lengthwise and crosswise, substantially as set forth.

6th, The combinati on in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, and pattern-holder, whose thickness at different parts of its length can be varied by adjustment, substantially as set forth.

7th, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, and the pattern-holder, whose thickness at different parts of its length and breadth can be varied by adjustment, substantially as set forth.

8th, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, pattern-holder, and spring to maintain a yielding pressure on the article during grinding, substantially as set forth.

9th, The combination in a grinding machine of the following instrumentalities, viz., the revolving grinder, bearing for the article, pattern-holder, spring to maintain a yielding pressure on the article during grinding, and mechanism to move the said pattern-holder past the grinder, substantially as set forth.

2,291.—COOKING STOVE.—Daniel E. Paris, Troy, N. Y., assignee by mesne-assignments of Samuel B. Spaulding, Brandon Vt. Letters-Patent No. 20,668 dated June 22, 1858; additional improvement May 17, 1859:

I claim, 1st, The extending of one or more of the flues of a square-shaped or diving-flue cooking stove, so as to conduct the heat and products of combustion under the bottom of a reservoir or water-tank and against it before the same passes into the exit-pipe, when the said reservoir is placed wholly or partly below the top of the stove, and in rear of the back flue or flues thereof, substantially as herein described and set forth.

2d, A return-flue so constructed that the heat will be conducted under the bottom of a reservoir or water-tank, and thence back to the exit-flue or pipe, and when the whole or a part of the reservoir is placed below the surface of the stove, and in rear of the back flue or flues thereof, substantially as herein described and set forth.

3d, The damper, F, so arranged and operated as to throw the heat and products of combustion under the reservoir, E, and against it, or by a proper adjustment or change of position there of to allow the same to pass directly into the exit-flue, I, substantially as herein described and set forth.

4th, Constructing the flues which pass under the oven of a cooking stove in such a manner that the heat and products of combustion will pass under the hearth in front of the stove, substantially in the manner and for the purpose herein described and set forth.

5th, The hot-air chamber projecting out from and situated immediately in the rear end of the stove and back of the flue or flues connected therewith by means of an aperture or opening in and through the rear end and vertical plate of the cooking stove, so as to permit or allow the heat or heated air, or escaping products of combustion to pass through the same into such chamber or its equivalent, and thereafter come in direct contact with the reservoir or water-tank, arranged for the purposes substantially as aforesaid.

6th, An open seat or outward projecting chamber which shall receive and contain said reservoir or water-tank, and formed on the back end of a cooking stove, so that such reservoir shall itself form the covering or a part of the outer casing of the rear flue or flues, and of the said hot-air chamber combined just below the same, in the manner substantially as herein described and set forth.

7th, The arrangement of an aperture, opening, or openings, constructed in and through the rear vertical end-plate of the stove so that the heat, hot-air, or escaping products of combustion may by the means thereof come in positive contact with the bottom or other exposed parts or portion of said reservoir or water-tank, and thereby heat or warm the water therein, substantially as herein described and set forth.

8th, The arrangement of a reservoir or water-tank, with the whole or part thereof sustained or supported substantially as herein described and set forth, in combination with an aperture or opening or openings in and through the rear vertical end plate of said stove, for the purposes substantially as herein described and set forth.

9th, The arrangement of a hot-air or warming or drying chamber or closet directly underneath the bottom of the cooking stove, in combination with the downward projecting bottom, x, of the horizontal flue or flues of the stove into such chamber or closet, in the manner and for the purpose substantially as herein described and set forth.

10th, The suspending and supporting of a cooking stove, without the use of the ordinary legs, upon the surrounding casing or box, C, which forms the hot-air or drying chamber or closet, between the seam and the floor, substantially as herein described and set forth.

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Improved Saw Gummer.

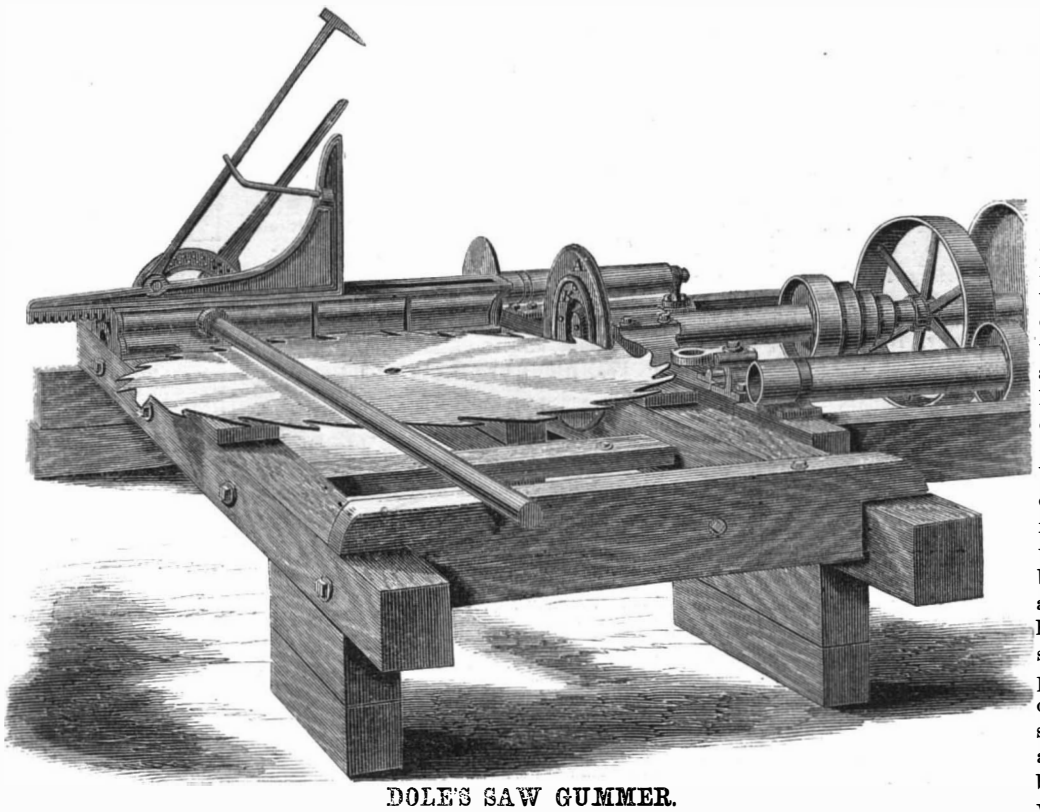
This engraving represents a new method of "gumming" circular saws, or, in other words, cutting out the throat of the tooth so that the dust will have a free opportunity to escape without clogging and binding the saw.

The tool is designed to be applied to the mandrel the saw itself works on, so that by merely removing it, and substituting the gummer, the operation can be performed without any other special fixtures.

The gummer itself consists of a grindstone or emery wheel, A, made of vulcanized rubber and emery, in the shape of a ring. This ring is clamped between two iron plates, B, and firmly held by screws, so that it cannot shift or change its position. Thus constructed it is applied to the saw mandrel and secured thereon, as the saw itself is, with a nut.

The saw, when operated on, is laid on the carriage or timbers of the mill—as shown in the engraving—which renders it easy of access during the job.

Many persons using this gummer speak highly of its qualities, and the proprietors are prepared to fill orders for them. It was patented on Nov. 15, 1864, by L. A. Dole. For further information address Dole, Silver & Deming, manufacturers, Salem, Ohio.



DOLE'S SAW GUMMER.

The Largest Farm in the World.

I observe a note in your last issue, of an 8,000-acre farm, in Bureau county, Ill., and of Mr. J. S. Alexander's farm in Morgan county, Ill., both of which will pass for fair-sized Illinois farms. But the farm which is, no doubt, the largest cultivated farm in the world, and, I believe, the best, is owned and cultivated by M. L. Sullevant, Esq., formerly from the vicinity of Columbus, Ohio, now of Champaign county, Ill. He owns and presides over 70,000 acres of the best land on this hemisphere, 23,000 acres of which are under fence, and in actual improvement and cultivation; the balance is used for herding.

I will venture the opinion that there cannot be found five acres of unserviceable land on Mr. S.'s entire 70,000 acres. Their productiveness is unsurpassed. Almost all of Mr. S.'s farming is conducted by labor-saving machinery, so that it is estimated that, throughout, one man will perform the average labor of four or five, as conducted on small farms. He drives his posts by horse-power; breaks his ground by Comstock's "spaders;" mows, rakes, loads, unloads, and stacks his hay by horse-power; cultivates his corn by improved machinery; ditches any low ground by machinery; sows and plants by machinery, so that all his laborers can ride and perform their tasks as easy as riding in a buggy.

I had the pleasure of being present when he harvested a thousand acres of his wheat; this was done with ———'s "Header's"—about eight or ten men and twenty horses cut and safely stacked away about 200 acres a day, and performed the work better than I ever saw it by the old modes. To give all the improved modes of farming employed by this king of agriculture, would require more space than you would like to spare. Notwithstanding all this labor-saving machinery, Mr. S. employs from one to two hundred laborers, some two hundred horses and mules, and a large herd of working oxen.

Not having the exact data before me, I will not venture to give the enormous returns, in bushels or tuns, of the products of this great farm. Some estimate may be made from the magnitude of the farm, taken in connection with the fact that the quality of the soil is unequaled by the very best Sciota bottoms.

Mr. Sullevant's annual profits are becoming enormous, and put to shame the oft-repeated nonsense about economy of "small farms," which had its origin with English landlords, who wish to keep the small farmer with his nose upon an eternal grindstone. Time will soon clear away this error, and farming (except for garden vegetables) will be ruinous unless upon a scale large enough to employ modern agricultural machinery to advantage.—*Cor. Cin. Inquirer.*

HART'S CRAVAT HOLDER.

The starched lawn neckerchief, and the heavy Italian silk tie, which swathed the neck in voluminous folds, have given place to a simple bow worn in front of the collar, leaving the neck free and adding much to the convenience and natty appearance of this portion of the masculine costume. The trouble has been that the closing neck button of the shirt had to perform the treble office of securing the binding, the collar, and the cravat, producing too much strain on one button.

Fig. 1.

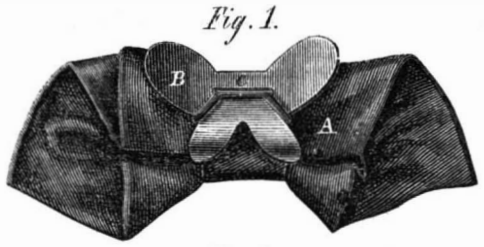
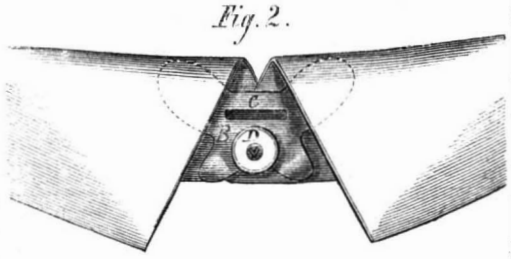


Fig. 2.



The device here illustrated is intended to relieve this dependence on the button and to keep the bow in shape. Fig. 1 shows a back or inside view of the knot and holder. A is the bow or knot, and B the holder. A slot, C, in the holder, which is of metal, silvered or enameled, receives the elastic loop, which then passes over the lower branches of the holder. These lower branches pass on either side of the button, D, and the upper branches pass under the collar. Fig. 2 shows the holder without the knot. By this device the knot or butterfly is held securely in place, but can be easily exchanged for another. The form and use of the holder can be readily understood by the two figures.

This very convenient invention was patented May 8, 1866, by Wm. H. Hart, Jr., and is manufactured by Hurlbut & Lavery, sole agents and manufacturers, No. 21 Bank street, Philadelphia, to whom all orders should be addressed.

A Cheap Furnace for Chemical Experiments.

A correspondent who is an amateur chemist, sends a drawing and description of a cheap furnace, which he says he has used successfully for two years. He takes a piece of eight-inch stove funnel, twelve or fourteen inches high, and furnished with a cap at the top, which can be removed at pleasure. At the bottom a small hole is cut in the side to receive the pipe from a blower, and the whole funnel is lined inside with pipe clay mixed with sand.

Three inches from the bottom the lining is increased in thickness and receives some bits of wire, which form a grate. The blower is eight inches diameter and three wide, having four fans made of sheet iron, tin, or even pasteboard, as is also its case, and is driven by a small pulley belting from a larger one designed to be turned by hand. The whole arrangement can be secured to a board, that portion under the furnace being protected by sheet-iron.

In such a furnace our correspondent says he has melted cast iron and manganese in a few minutes. He prefers coke to coal, as giving a more intense heat. His suggestions appear to be valuable to amateurs who do not wish to incur the expense of a complete apparatus.

MECHANICS

INVENTORS, MANUFACTURERS.

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